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Improvement in Power Hammers.

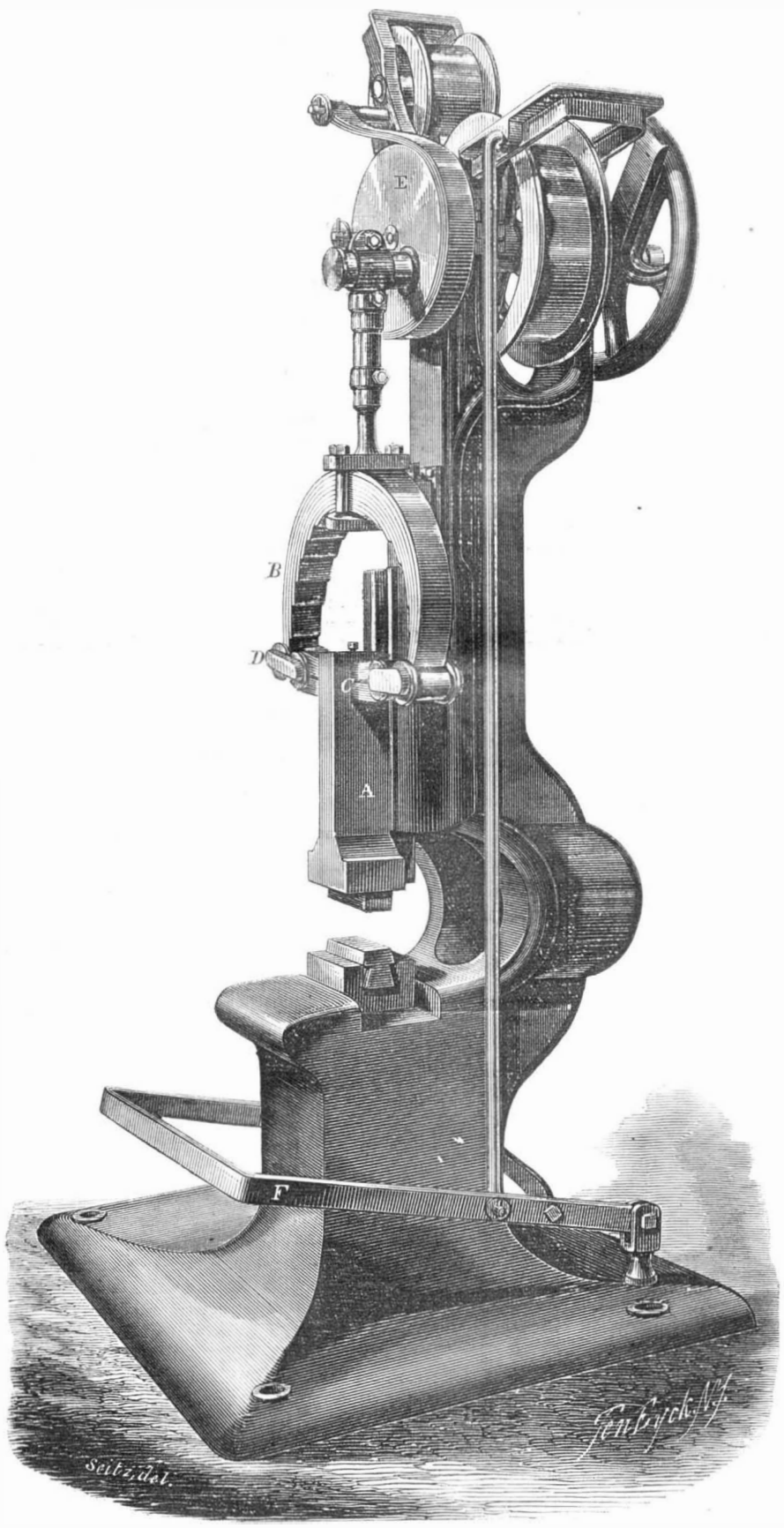
We present herewith an engraving of this well-known power hammer. Since its introduction to manufacturers, nearly two years ago, it has been radically improved in its details and is considered one of the best machines for general work now in use.

The makers say: "In presenting this machine to the notice of manufacturers we claim that it has certain features which make it indispensable for general purposes. It is a well known fact that the jar of the blow in common hammers is a source of great injury to the machine, inasmuch as the working parts are often disabled thereby; nuts are loosened, keys are slackened off, and constant supervision must be maintained in order to prevent breaking down; with all the care that can be taken such accidents frequently happen. This hammer is entirely free from dangers of this class; from the fact of the ram being supported on an elastic substance—leather—and attached to a steel spring; through these agents the recoil is taken up, so that it is entirely distributed through them. It is particularly adapted to working thin steel, which from its incapacity to bear great heat, must be worked rapidly. In action the blow is quick and square; no double blow is given by it either on low or high heats, an advantage which will be appreciated by the trade. It occupies but little room and takes but a tithe of the power required to work the old fashioned trip hammer. It is all contained in the frame, as shown by the engraving, and is ready for use so soon as set on its foundation. It can be run very rapidly; from 500 revolutions per minute for the smallest to 120 for the largest, the sizes at these velocities being respectively 15 pounds weight of ram, and 2,000 pounds weight of ram. It is believed that this last is the largest hammer run by a belt, in the world; the net weight of the whole machine being 26,000 lbs. These hammers have been severely tested for the last two years on all kinds of work, and testimonials innumerable, as well as the hammers themselves, can be shown. Hoe makers, shovel makers, steel workers, cutlery, hatchet, gimlet, file, horse-shoe, spring, wrench, axle, gun, and other manufacturers are all using these hammers for various purposes and with great success.

To those who see this machine for the first time, a brief explanation of its details and action will be necessary. The chief peculiarity is suspending the ram, **A**, from the steel spring, B, by an ordinary leather belt, C. This belt passes through the hole in the head of the ram and is attached to the spring by jointed rollers, D, which permit the hammer, when driven up and down by the crank wheel, E, to slide up and down freely in the guide. This latter has a gib at the back for taking up the wear. The vertical movement given to the spring by the crank, compresses it so that at the return stroke the spring reacts and gives a blow of great force, which is varied in intensity by regulating the speed by the foot gear, F; one man can manage a 100 lbs. hammer with ease in this way. This is the whole and sole peculiarity of construction, and experience shows it to be one of great value. The engraving represents a 100-lb. ram and 16-inch stroke."

In conclusion, it is claimed that for a strong, durable, rapid working, and square striking hammer it is unsurpassed. One of a thousand pounds weight of ram—net weight of machine 22,000—has been for the past eighteen months at work in the Hudson River Railway shops, foot of 30th street, New York city, and is in constant use making from an inch bolt to drawing down a seven-inch axle, and has never had a cent expended on it for repair. Parties contemplating the erection of works or extending old ones, as well as others needing machines of this kinds are invited to correspond with the manufacturer.

Sizes now made are respectively fifteen, twenty-five, fifty, one hundred, two hundred and fifty, five hundred, one thousand, and two thousand pounds weight of ram and having capacity to draw iron one inch, square, two inches, three, inches, four, six, seven, eight and ten inches square with rapidity and economy.



THE SHAW AND JUSTICE DEAD STROKE HAMMER.

Further information concerning prices and where hammers can be seen will be given by addressing Philip S. Justice, 42 Cliff St., New York, or 14 North 5th St., Philadelphia, Pa.

Novelties in Paris.

"Malakoff," the intelligent correspondent of the *N. Y. Times*, gives the following as among the most recent sensations in Paris:

VELOCIPEDES.

Something like a year ago I described the new mode of locomotion by velocipedes, and was probably laughed at for predicting that the days of the horse, except as a luxury for the table, were drawing to a close. Since then the velocipede has made its way in the world. It has entered so completely into the everyday life of people, it has become so useful an element of conversation, that one wonders how the world did without it. Every family will soon have its velocipede. We are having races organized in every direction, the same as for horses and boats. Young men think nothing of running out to their country houses of a forenoon at a distance of thirty or forty miles. The most expert make their twelve miles an hour, and at that rate we shall soon hear of velocipedes with cow-catchers!

We have also marine velocipedes. For a placid lake or river no more charming invention was ever thought of. The first one may be seen on the lake of Enghein, twelve miles from Paris, and was constructed at Saint Denis. Imagine two snow-shoes, so to speak, held together by iron rods at a yard's distance, and between these the propelling wheel, about a yard in diameter, with paddles eight inches long and four wide. Then behind and almost on a level with the top of the wheel—why would not a screw be easier to propel?—a saddle for the driver, and to the wheel on each side driving cranks for the feet, the wheel and seat covered with sheet iron to prevent wetting. Over the wheel is fixed a swivel handle of iron for the hands, and to the ends of this handle the tillers for the two rudders.

With this simple machine, which is more difficult to upset than a boat, and which is always ready for use, since it requires no oars, or detached pieces, a man may outrun a boat, he may carry messages, go a fishing, or drive it for pleasure or exercise. It backs and turns with the slightest movement of the foot, and as the feet are always resting in place, there is no time lost, as in the lifting and adjusting of oars. The two perissoirs—we may as well make English sense of it at once—are six or eight inches diameter, and made of mahogany about the thickness of bookbinder's boards. This new invention is destined to a great success in all aquatic localities.

But we have still another invention which will do more for the decadence of the horse than the velocipede, for this latter machine has two serious enemies—mud and rain. An inventor has at last perfected—at least, so it is claimed—an idea which has ruined more men than the world will ever know of. He has perfected a small steam locomobile for one person for the streets and common roads, by which a man may for half the money, and in half the time, make his daily visits of business or pleasure. With this mode of locomotion his dignity will be saved, for there are four wheels and a cover, and it does not look as cheap as a velocipede.

Thus, I repeat, the dignity of man requires that the horse, the same as cattle and hogs and sheep, should be banished from large and elegant cities like Paris. Inventors ought to hide their heads in shame, not to have been able before now, with all their knowledge of the power of steam and electricity, and gas, and ether, and compressed air, to discover a means of dragging rapidly over common roads, a weight of two or three hundred pounds—in other words, of finding a cheap mechanical substitute for the horse.

THE DEAD ALIVE.

Here is something gay, on the contrary, in the way of inventions. You remember Edgar Poe's catalepsy coffin with inside cushions for comfort, and springs for the moment of waking. The idea was very elementary and perhaps practical. But a Frenchman has beaten it all to pieces. He calls his invention a "Respiratory-Advertising Apparatus for Precipitate Inhumations." You can see the mechanism of the thing from where you are. "You can breathe while notifying the outside world that you are resurrected." What *naiveté!* By this invention the buried individual puts himself in communication with the living by means of a tube fixed over the mouth with a funnel-shaped mouth-piece, the

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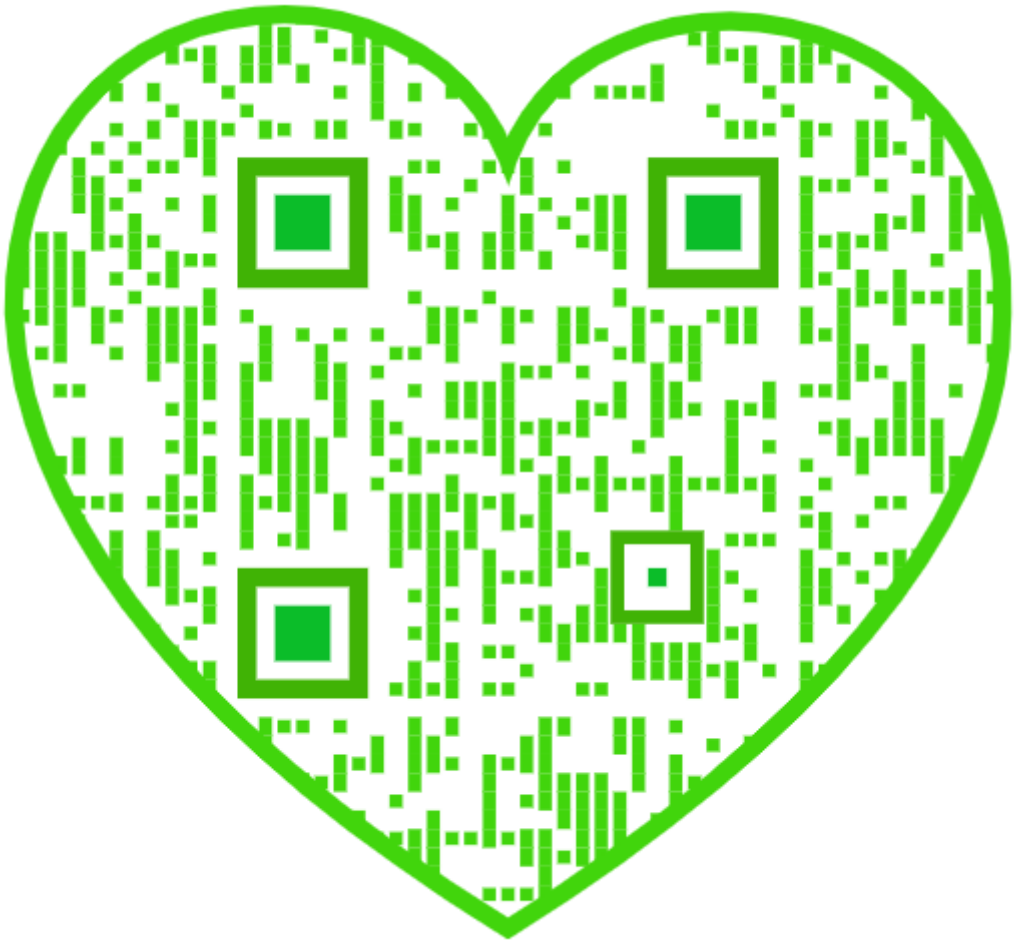

other end projecting from the earth or stone above. "If the individual," to quote the prospectus, "finds himself uneasy in his position (!) he has only to demand the attention of the guardians of the cemetery, which he can easily do, and his case will be attended to at once."

So that if this ingenious invention comes into general use, the people who select the cemeteries as a place of resort, must not be surprised hereafter at hearing queer sounds from time to time proceeding from the earth around them. We can imagine the surprised promenader exclaiming to a guardian: "What! do you allow people to play the trombone here?" and the guardian replying: "That's no trombone. It's the old fellow of yesterday—down there—the seventh to the left—who demands a change of base!"

The inventor thinks no man ought to be without one of his tubes. The charming man! Pretty soon he will pretend that children cry for them!

From the Atlantic Monthly for August.

WILL THE COMING MAN DRINK WINE?

The teetotalers confess their failure. After forty-five years of zealous and well-meant effort in the "cause," they agree that people are drinking more than ever. Dr. R. T. Trall, of New York, the most thorough-going teetotaler extant, exclaims, "Where are we to-day? Defeated on all sides. The enemy victorious and rampant everywhere. More intoxicating liquors manufactured and drunk than ever before. Why is this?" Why, indeed! When the teetotalers can answer that question correctly, they will be in a fair way to gain upon the "enemy" that is now so "rampant." They are not the first people who have mistaken a symptom of disease for the disease itself, and striven to cure a cancer by applying salve, and plaster, and cooling washes to the sore. They are not the first travelers through this wilderness who have tried to extinguish a smoldering fire, and discovering at last that they have been pouring water into the crater of a volcano.

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Our teetotal friends have not neglected the scientific questions involved in their subject, nor have they settled them. Instead of insulting the public intelligence by asserting that the wines mentioned in the Bible were some kind of unintoxicating slop, and exasperating the public temper by premature prohibitory laws, they had better expend their strength upon the science of the matter, and prove to mankind, if they can, that these agreeable drinks which they denounce are really hurtful. We all know that excess is hurtful. We also know that adulterated liquors may be. But is the thing itself pernicious?—pure wine taken in moderation? good beer? genuine Old Bourbon?

For one, I wish it could be demonstrated that these things are hurtful. Sweeping, universal truths are as convenient as they are rare. The evils resulting from excess in drinking, are so enormous and so terrible that it would be a relief to know that alcoholic liquors are in themselves evil, and to be always avoided. What are the romantic woes of a Desdemona, or the brief picturesque sorrows of a Lear, compared with the thirty years' horror and desolation caused by a drunken parent? We laugh when we read Lamb's funny description of his waking up in the morning, and learning in what condition he had come home the night before by seeing all his clothes carefully folded. But his sister Mary did not laugh at it. He was all she had; it was tragedy to her, this self-destruction of her sole stay and consolation. Goethe did not find it a laughing matter to have a drunken wife in his house for fifteen years, nor a jest to have his son brought in drunk from the tavern, and to see him dead in his coffin, the early victim of champagne. Who would not like to have a clear conviction, that what we have to do with all such fluids is to let them alone? I am sure I should. It is a great advantage to have your enemy in plain sight, and to be sure he is an enemy.

What is wine? Chemists tell us they do not know. Three-fifths of a glass of wine is water. One-fifth is alcohol. Of the remaing fifth, about one-half is sugar. One-tenth of the whole quantity remains to be accounted for. A small part of that tenth is the acid which makes vinegar sour. Water, alcohol, sugar, acid—these make very nearly the whole body of the wine; but if we mix these things in proportions in which they are found in Madeira, the liquid is a disgusting mess, nothing like Madeira. The great chemists confess that they do not know what that last small fraction of the glass of wine is, upon which its flavor, its odor, its value, its fascination depend. They do not know what it is that makes the difference between port and sherry, but are obliged to content themselves with giving it a hard name.

Similar things are admitted concerning the various kinds of spirituous and malt liquors. Chemistry seems to agree with the temperance society, that wine, beer, brandy, whisky, and rum are alcohol and water, mixed in different proportions, and with some slight differences of flavoring and coloring matter. In all these drinks, teetotalers maintain, alcohol is power, the other ingredients being mere dilution and flavoring. Wine, they assure us, is alcohol and water flavored with grapes; beer is alcohol and water flavored with malt and hops; Bourbon whisky is alcohol and water flavored with corn. These things they assert, and the great chemists do not enable us drinkers of those seductive liquors to deny it. On the contrary, chemical analysis, so far as it has gone, supports the teetotal view of the matter.

What does a glass of wine do to us when we have swallowed it?

We should naturally look to physicians for an answer to such a question; but the great lights of the profession—men of the rank of Astley Cooper, Brodie, Abernethy, Holmes—all assure the public, that no man of them knows, and no man has ever known, how medicinal substances work in the system, and why they produce the effects they do. Even of a substance so common as Peruvian bark, no one knows why and how it acts as a tonic; nor is there any certainty of its being a benefit to mankind. There is no science of medicine. The "Red Lane" of the children leads to a region which is still mysterious and unknown; for when the eye can explore its recesses, a change has occurred in it, which is also mysterious and unknown; it is dead. Quacks tell us, in every newspaper, that they can cure and prevent disease by pouring or dropping something down our throats, and we have heard this so often that, when a man is sick, the first thing that occurs to him is to "take physic." But physicians who are honest, intelligent, and in an independent position, appear to be coming over to the opinion that this is generally a delusion. We see eminent physicians prescribing for the most malignant fevers little but open windows, plenty of blankets, Nightingale nursing, and beef tea. Many young physicians, too, have gladly availed themselves of the ingenuity of Hahnemann, and satisfy at once their consciences and their patients by prescribing doses of medicine that are next to no medicine at all. The higher we go among the doctors, the more sweeping and emphatic is the assurance we receive that the profession does not understand the operation of medicines in the living body, and does not really approve their employment.

If something more is known of the operation of alcohol than of any other chemical fluid—if there is any approach to certainty respecting it—we owe it chiefly to the teetotalers, because it is they who have provoked contradiction, excited inquiry, and suggested experiment. They have not done much themselves in the way of investigation, but they started the topic, and have kept it alive. They have also published a few pages which throw light upon the points in dispute. After going over the ground pretty thoroughly, I can tell the reader in a few words the substance of what has been ascertained, and plausibly inferred, concerning the effects of wine, beer, and spirits upon the human constitution.

They cannot be nourishment, in the ordinary acceptation of that word, because the quantity of nutritive matter in them is so small. Liebig, no enemy of beer, says this: "We can prove, with mathematical certainty, that as much flour or meal as can lie on the point of a table knife, is more nutritious than nine quarts of the best Bavarian beer; that a man who is able daily to consume that amount of beer, obtains from it in a whole year, in the most favorable case, exactly the amount of nutritive constituents which is contained in a five-pound loaf of bread, or in three pounds of flesh." So of wine; when we have taken from a glass of wine the ingredients known to be innutritious, there is scarcely anything left but a grain or two of sugar. Pure alcohol, though a product of highly nutritive substances, is a mere poison, an absolute poison, the mortal foe of life in every one of its forms, animal and vegetable. If, therefore, these beverages do us good, it is not by supplying the body with nourishment.

Nor can they aid digestion by assisting to decompose food. When we have taken too much shad for breakfast, we find that a wineglass of whisky instantly mitigates the horrors of indigestion and enables us again to contemplate the future without dismay. But if we catch a curious fish or reptile, and want to keep him from decomposing, and bring him home as a contribution to the museum of Professor Agassiz, we put him in a bottle of whisky. Several experiments have been made, with a view to ascertain whether mixing alcohol with the gastric juice increases or lessens its power to decompose food, and the results of all of them point to the conclusion that the alcohol retards the process of decomposition. A little alcohol retards it a little, and much alcohol retards it much. It has been proved by repeated experiment, that any portion of alcohol, however small, diminishes the power of the gastric juice to decompose. The digestive fluid has been mixed with wine, beer, whisky, brandy, and alcohol diluted with water, and kept at the temperature of the living body, and the motions of the body imitated during the experiment; but, in every instance, the pure gastric juice was found to be the true and sole digester, and the alcohol a retarder of digestion. This fact, however, required little proof. We are all familiar with alcohol as a preserver, and scarcely need to be reminded that, if alcohol assists digestion at all, it cannot be by assisting decomposition.

Nor is it a heat-producing fluid. On the contrary, it appears in all cases to diminish the efficiency of the heat-producing process. Most of us who live here in the North, and who are occasionally subjected to extreme cold for hours at a time, know this by personal experience, and all the Arctic voyagers attest it. Brandy is destruction when men have to face a temperature of 60° below zero; they want lamp oil then, and the rich blubber of the whale and walrus. Dr. Rae, who made two or three pedestrian tours of the Polar regions, and whose powers of endurance were put to as severe a test as man's ever were, is clear and emphatic upon this point. Brandy, he says, stimulates but for a few minutes, and greatly lessens a man's power to endure cold and fatigue. Occasionally, we have in New York a cool breeze from the north which reduces the temperature below zero—to the sore discomfort of omnibus drivers and car drivers, who have to face it on their way up town. On a certain Monday night, two or three winters ago, twenty-three drivers on one line were disabled by the cold, many of whom had to be lifted from the cars and carried in. It is a fact familiar to persons in this business, that men who drink freely are more likely to be benumbed and overcome by the cold than those who abstain. It seems strange to us, when we first hear it, that a meager teetotaler should be safer on such a night than a bluff, red-faced imbiber of beer and whisky, who takes something at each end of the line to keep himself warm. It nevertheless appears to be true. A traveler relates that, when Russian troops are about to start upon a march in a very cold region, no grog is allowed to be served to them; and when the men are drawn up, ready to move, the corporals smell the breath of every man, and send back to quarters all who have been drinking. The reason is, that men who start under the influence of liquor are the first to succumb to the cold, and the likeliest to be frost-bitten. It is the uniform experience of the hunters and trappers in the northern provinces of North America, and of the Rocky Mountains, that alcohol diminishes their power to resist cold. This whole paper could be filled with testimony on this point.

Still less is alcohol a strength-giver. Every man that ever trained for a supreme exertion of strength knows that Tom Sayers spoke the truth when he said: "I am no teetotaler; but when I've any business to do, there's nothing like water and the dumb-bells." Richard Cobden, whose powers were subjected to a far severer trial than a pugilist ever dreamed of, whose labors by night and day, during the corn-law struggle, were excessive and continuous beyond those of any other member of the House of Commons, bears similar testimony. "The more work I have had to do, the more I have resorted to the pump or the teapot. On this branch of the subject, all the testimony is against alcoholic drinks. Whenever the point has been tested—and it has often been tested—the truth has been confirmed, that he who would do his very best and most, whether in rowing, lifting, running, watching, mowing, climbing, fighting, speaking, or writing, must not admit into his system one drop of alcohol. Trainers used to allow their men a pint of beer per day, and severe trainers half a pint; but now the knowing ones have cut off even that moderate allowance, and brought their men down to cold water, and not too much of that, the soundest digesters requiring little liquid of any kind. Mr. Bigelow, by his happy publication lately of the correct version of Franklin's Autobiography, has called to mind the famous beer passage in that immortal work: "I drank only water; the other workmen, near fifty in number, were great guzzlers of beer. One occasion I carried up and down stairs a large form of types in each hand, when others carried but one in both hands." I have a long list of references on this point; but, in these cricketing, boat-racing, prize-fighting days, the fact has become too familiar to require proof. The other morning, Horace Greeley, teetotaler, came to his office after an absence of several days, and found letters and arrears of work that would have been appalling to any man but him. He shut himself in at ten A. M., and wrote steadily, without leaving his room, till eleven P. M.—thirteen hours. When he had finished, he had some difficulty in getting down stairs, owing to the stiffness of his joints, caused by the long inaction; but he was as fresh and smiling the next morning as though he had done nothing extraordinary. Are any of us drinkers of beer and wine capable of such a feat? Then, during the war, when he was writing his history, he performed every day, for two years, two days' work,—one from nine to four, on his book; the other, from seven to eleven, upon *The Tribune*; and, in addition, he did more than would tire an ordinary man, in the way of correspondence and public speaking. I may also remind the reader, that the clergyman who, of all others in the United States, expends most vitality, both with tongue and pen, and who does his work with least fatigue and most gaiety of heart, is another of Franklin's "water Americans."

If, then, wine does not nourish us, does not assist the decomposition of food, does not warm, does not strengthen, what does it do?

We all know that, when we drink alcoholic liquor, it affects the brain immediately. Most of us are aware, too, that it affects the brain injuriously, lessening at once its power to discern and discriminate. If I, at this ten A. M., full of interest in this subject, and eager to get my view of it upon paper, were to drink a glass of the best port, Madeira, or sherry, or even a glass of lager beer, I should lose the power to continue in three minutes; or, if I persisted in going on, I should be pretty sure to utter paradox and spurts of extravagance which would not bear the cold review of to-morrow morning. Any one can try this experiment. Take two glasses of wine, and then immediately apply yourself to the hardest task your mind ever has to perform, and you will find you cannot do it. Let any student, just before he sits down to his mathematics, drink a pint of the poorest beer, and he will be painfully conscious of loss of power. Or, let any salesman, before beginning with a difficult but important customer, perform the idiotic action of "taking a drink," and he will soon discover that his ascendency over his customer is impaired. In some way this alcohol, of which we are so fond, gets to the brain and injures it. We are conscious of this, and we can observe it. It is among the wine-drinking classes of our fellow beings that absurd, incomplete, and reactionary ideas prevail. The receptive, the curious, the candid, the trustworthy brains—those that do not take things for granted, and yet are ever open to conviction—such heads are to be found on the shoulders of men who drink little or none of these seductive fluids. How we all wondered that England should think so erroneously, and adhere to its errors so obstinately, during our late war! Mr. Gladstone has in part explained the mystery. The adults of England, he said, in his famous wine speech, drink, on an average, three hundred quarts of beer each per annum. Now, it is physically impossible for a human brain, muddled every day with a quart of beer, to correctly hold correct opinions, or appropriate pure knowledge. Compare the conversation of a group of Vermont farmers, gathered on the stoop of a country store on a rainy afternoon, with that which you may hear in the farmers room of a market-town inn in England. The advantage is not wholly with the Vermonters; by no means, for there is much in human nature besides the brain and the things of the brain. But in this one particular—in the topics of conversation, in the interest manifested in large and important subjects—the water-drinking Vermonters are to the beer-

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drinking Englishman, what Franklin was to the London printers. It is beyond the capacity of a well-beered brain even to read the pamphlet on Liberty and Necessity, which Franklin wrote in those times.

The few experiments which have been made, with a view to trace the course of alcohol in the living system, all confirm what all drinkers feel, that it is to the brain that alcohol hurries when it has passed the lips. Some innocent dogs have suffered and died in this investigation. Dr. Percy, a British physician, records, that he injected two ounces and a half of alcohol into the stomach of a dog, which caused its almost instant death. The dog dropped very much as he would if he had been struck upon the head with a club. The experimenter without a moment's unncessary delay, removed the animal's brain, subjected it to distillation, and extracted from it a surprising quantity of alcohol,—a larger proportion than he could distill from the blood or liver. The alcohol seemed to have rushed to the brain; it was a blow upon the head which killed the dog. Dr. Percy introduced into the stomachs of other dogs smaller quantities of alcohol, not sufficient to cause death; but upon killing the dogs, and subjecting the brain, the blood, the bile, the liver, and other portions of the body to distillation, he invariably found more alcohol in the brain than in the same weight of other organs. He injected alcohol into the blood of dogs, which caused death; but the deadly effect was produced, not upon the substance of the blood, but upon the brain. His experiments go far toward explaining why the drinking of alcoholic liquors does not sensibly retard digestion. It seems that, when we take wine at dinner, the alcohol does not remain in the stomach, but is immediately absorbed into the blood, and swiftly conveyed to the brain and other organs. If one of these "four-bottle men" of the last generation had fallen down dead, after boozing till past midnight, and he had been treated as Dr. Percy treated the dogs, his brain, his liver, and all the other centers of power, would have yielded alcohol in abundance; his blood would have smelt of it; his flesh would have contained it; but there would have been very little in the stomach. Those men were able to drink four, six, and seven bottles of wine at a sitting, because the sitting lasted four, six, and seven hours, which gave time for the alcohol to be distributed over the system. But instances have occurred of laboring men who have kept themselves steadily drunk for forty-eight hours, and then died. The bodies of two such were dissected some years ago in England, and the food which they had eaten at the beginning of the debauch was undigested. It had been preserved in alcohol as we preserve snakes.

Once, and once only, in the lifetime of man, an intelligent human eye has been able to look into the human stomach, and watch the process of digestion. In 1822, at the United States Military post of Michilimackinac, Alexis St. Martin, a Canadian of French extraction, received accidentally a heavy charge of duck-shot in his side, while he was standing one yard from the muzzle of the gun. The wound was frightful. One of the lungs protruded, and from an enormous aperture in the stomach the food recently eaten was oozing. Dr. William Beaumont, U. S A., the surgeon of the post, was notified, and dressed the wound. In exactly one year from that day the young man was well enough to get out of doors, and walk about the fort; and he continued to improve in health and strength, until he was as strong and hardy as the most of his race. He married, became the father of a large family, and performed for many years the laborious duties appertaining to an officer's servant at a frontier post. But the aperture into the stomach never closed, and the patient would not submit to the painful operation by which such wounds are sometimes closed artificially. He wore a compress arranged by the doctor, without which his dinner was not safe after he had eaten it.

By a most blessed chance, it happened that this Dr. William Beaumont, stationed there on the outskirts of creation, was an intelligent, inquisitive human being, who perceived all the value of the opportunity afforded him by this unique event. He set about improving that opportunity. He took the young man into his service, and, at intervals, for eight years, he experimented upon him. He alone among the sons of men has seen liquid flowing into the stomach of a living person, while yet the vessel was at the drinker's lips. Through the aperture (which remained two and a half inches in circumference) he could watch the entire operation of digestion, and he did so hundreds of times. If the man's stomach ached, he could look into it and see what was the matter; and, having found out, he would drop a rectifying pill into the aperture. He ascertained the time it takes to digest each of the articles of food commonly eaten, and the effects of all the usual errors in eating and drinking. In 1833 he published a thin volume, at Plattsburg, on Lake Champlain, in which the results of thousands of experiments and observations were only too briefly stated. He appears not to have heard of teetotalism, and hence all that he says upon the effects of alcoholic liquors is free from the suspicion which the arrogance and extravagance of some teetotalers have thrown over much that has been published on this subject. With a mind unbiased, Dr. Beaumont, peering into the stomach of this stout Canadian, notices that a glass of brandy causes the coats of that organ to assume the same inflamed appearance as when he had been very angry, or much frightened, or had over eaten, or had had the flow of perspiration suddenly checked. In other words, brandy played the part of a foe in his system, and not that of a friend; it produced effects which were morbid, not healthy. Nor did it make any material difference whether St. Martin drank brandy, whisky, wine, cider, or beer, except so far as one was stronger than the other.

"Simple water," says Dr. Beaumont, "is perhaps the only fluid that is called for by the wants of the economy. The artificial drinks are probably all more or less injurious; some more so than others, but none can claim exemption from the general charge. Even tea and coffee, the common beverages of all classes of people, have a tendency to debilitate the digestive organs. * * * The whole class of alcoholic liquors may be considered as narcotics, producing very little difference in their ultimate effects upon the human system.

He ascertained, too, (not guessed, or inferred, but ascertained, watch in hand) that such things as mustard, horse radish, and pepper retard digestion. At the close of his valuable work, Dr. Beaumont appends a long list of "Inferences," among which are the following: "That solid food of a certain texture is easier of digestion than fluid; that stimulating condiments are injurious to the healthy system; that the use of ardent spirits always produces disease of the stomach if persisted in; that water, ardent spirits, and most other fluids, are not affected by the gastric juice, but pass from the stomach soon after they have been received." One thing appears to have much surprised Dr. Beaumont, and that was, the degree to which St. Martin's system could be disordered, without his being much inconvenienced by it. After drinking hard every day for eight or ten days, the stomach would show alarming appearances of disease; and yet the man would only feel a slight headache, and a general dullness and languor.

If there is no comfort for drinkers in Dr. Beaumont's precious little volume, it must also be confessed that neither the dissecting knife nor the microscope afford us the least countenance. All that has yet been ascertained of the effects of alcohol, by the disection of the body, favors the extreme position of the extreme teetotallers. A brain alcoholized the microscope proves to be a brain diseased. Blood which has absorbed alcohol is unhealthy blood,—the microscope shows it. The liver, the heart, and other organs which have been accustomed to absorb alcohol, all give testimony under the microscope which produces discomfort in the mind of one who likes a glass of wine, and hopes to be able to continue the enjoyment of it. The dissecting knife and the microscope, so far, have nothing to say for us,—nothing at all; they are dead against us.

[To be continued.]

THE ARTS AND MANUFACTURES OF SAVAGES.

THE recent lectures of Sir John Lubbock at the Royal Institution, upon the Arts and Manufactures of Savages, contain much useful information of interest not only to mechanics but to ethnologists, and the general reader. We condense from the *Engineer* the substance of a portion of these important lectures.

In the first lecture the speaker called attention to the habits and customs of savages. While speaking of the modes of torture adopted in many tribes to test the powers of endurance of their own warriors. Sir John Lubbock said that cutting and piercing wounds are not always so painful as they look. In proof of this he took a common pin, and with the back of a book beat it up to its head into his leg about eight inches above the knee, then pulled it out and went on with the lecture, saying that the operation caused him very little pain or inconvenience.

This experiment however illustrative or sensational it might have been, is not such as we should advise any of our young readers to repeat. We were once personally cognizant of the death of a shoemaker by lockjaw, resulting from a punctured wound in the thigh caused by the slipping of an awl, which was much less formidable apparently than the self-inflicted puncture in Sir John Lubbock's leg. In the second lecture he dealt more especially with the facts relating to the subject of this article. He said that animals although often using stones to crack nuts, etc., could not properly be said to use implements as everything used by them was in its natural condition.

Man, said the lecturer, was in his lowest state probably able to advance in the construction of implements faster than other animals owing to three causes, namely, mental power, the possesion of a hand, and the length of life which permits the accumulation of experience. However this may be, it is a fact that the lowest savages have a considerable variety of implements and weapons. These implements and weapons it is very difficult to classify, but perhaps the hammer and the knife may be regarded as a pair from which all the rest have sprung, even to the steam engine of modern times.

Two facts strike almost every-one who examines with attention any good collection of savage implements. First, how the same types are found repeated in different parts of the world, and secondly, how gradually the different types pass into one another. Weapons, which to our eye are very similar, would be far from presenting the same uniformity of appearance to the savage, just as one man prefers one kind of steel pen to another. The simplest of the whole series of human implements is the hammer. That with which the Botocudo in Brazil breaks the hard, thick-walled fruits of his primeval forest, is often nothing but a stone. Stones bearing marks of such use are to be found in all collections of ancient stone implements. Stones also were the earliest missiles of savages, and were thrown at first by hand; there are however, a few records by travelers respecting savages said to be very skillful in throwing stones with their feet. Slings of two kinds are in use among savage tribes—one being the string sling, and the other a stick with a cleft in the top in which the stone is placed. Professor Nillson has suggested that the sling used by David in his combat with Goliath was probably the latter kind, because the giant said —"Am I a dog, that thou comest to me with staves?"

The passage from the simple stone hammer to the club is easy, as the club is, after all, only an elongated hammer. Branches of trees, however, naturally take this shape, and were probably used before stone clubs, which are very rare weapons, though they are sometimes used. All savage races have some clubs, which are merely pieces of wood thicker at one end than the other; but besides these, there are generally many of more artificial forms, and which are more or less elaborately carved.

The boomerang may also be regarded as a modification of the club. It is remarkable, not only for its form and properties, but also because it seems to be peculiar to Australia. This was the opinion of Dr. Klemn, the greatest authority on such a subject. It has, indeed, been stated that the natives of the Upper Nile use iron boomerangs, and they do, no doubt, throw a flat iron club or scimitar; but the special characteristic of the boomerang is that of returning to the point from whence it is thrown, and this property, we are expressly told by Sir Samuel Baker, the so-called African boomerangs do not possess. The natives of Guzerat also possess a form of club, which Colonel Lane Fox calles a "boomerang," but in this case also it seems probable that it does not return.

Eyre thus describes the mode of throwing the boomerang: —"Those whose angles are slightly obtuse are usually thrown with the sharp edge against the wind, and go circling through the air with amazing velocity to a great hight and distance, describing nearly a parabola, and descending again at the foot of the person who throws them; those which have the largest obtuse angle are thrown generally against the ground, from which they bound up to a great hight, and with much force. With both, the natives are able to hit distant objects with accuracy, either in hunting or in war; in the latter case this weapon is particularly dangerous, as it is almost impossible, even when it is seen in the air, to tell which way it will go or where descend. I once nearly had my arm broken by a wangno while standing within a yard of the native who threw it, and looking out purposely for it."

The shield is probably a modification of the club. The shields of the Australians are narrow, and intended rather to ward off the missiles than to arrest them, being only two or two and a-half feet long, and at most eighteen inches broad. The shields of the Caffres are very large. Shields among savages are usually made of skin or hide and rarely of wood.

A few very low races of savages are entirely without cutting instruments, though such instances are most rare. The sharp edge of a piece of bamboo or cane forms a very good knife for some purposes, and bone knives are useful even in civilized communities. But the flint-flake is the habitual knife of savage life, and flint has taken a much more important part in the development of human civilization than we should have been disposed to admit a few years ago. The natural edges of some few flints may have given the first idea of a knife-edge, and even in the use of flint as hammers, sharp splinters would occasionally be knocked off. Typical flint-flakes such as these however, are not found in nature, nor must it be supposed they are easy to make, a peculiar "knack" being necessary, as anybody may prove by experiment. Among savages flint-flakes are very universally met with. They are more abundant of course, where flint naturally occurs, but they seem to have passed from hand to hand and from one tribe to another, until they have have traveled far from their place of manufacture. Some localities are known at which flint-flakes were evidently made in considerable numbers. All flakes having two sharp edges are at once fit for use and serve as knives, spear-heads, arrow-heads, and a variety of other purposes They have been wrought into fish hooks, and in the Paris Exposition there was a Circassian thrashing machine, consisting of a broad board studded with flint-flakes.

The axe, however, is the principal cutting instrument of savages, and the simpler forms of it have been nearly identical all over the world. No axes like those now employed by the Indians of North and South America have been used in Western Europe for many centuries, but in ancient times they were common here. It is so long since such axes were used in Europe that even in the times of the Romans, as now, when found by the ignorant peasantry, they were regarded as thunderbolts. The Danish axes were very well made. Now the question arises—"How were the axes of savages used?" No doubt they were much inferior to metal. Captain Cook tells us expressly that it was necessary to sharpen the South Sea axes "almost every minute, for which purpose a stone and a cocoanut shell full of water are always at hand." Moreover, even with the best of them it took several days labor to cut down a single tree, consequently we may be confident that no people who were acquainted with metal would have gone to the immense labor necessary to make a stone axe and to keep it in working order. They are very liable to break in use, and then have to be thrown away or re-ground. Still with stone axes the South Sea Islanders were able to cut down large trees and build canoes, some of which were ninety feet long. The handles of ancient axes, having been made of wood, have generally perished long ago, though not always. Many of the axes of metal now made and used by savages have unmistakably the old type of the stone blade.

The simplest form of spear is a mere stick of wood pointed at one or both ends, and sometimes hardened by being heated in the fire. The spears of the Australians are from eight to fourteen feet long. Some are merely pointed rods of hard wood, tipped with the sting of the sting-ray, and barbed with other smaller stings. Some have barbs of bone, others have barbs of wood, while others have a slit on one or both sides, in which is a row of pieces of shell or sharp stone. These spears are thrown with great force and skill.

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The lecturer having minutely described and exhibited the one pointed spears of different savage tribes, said that the South Sea Islanders occasionally poison their spears by thrusting them into a corpse, and leaving them while the flesh decays.

The spear is generall, and was probably originally thrown simply by the hand. Several races however, now possess an implement for the purpose, which is called a "throwing stick" or "spear caster." This throwing stick is a flat piece of hard wood, generally, but not always, broader in the middle, with a piece of bone or tooth at one end as a catch for the end of the spear, and a lump of gum at the other to keep the hand from slipping. The spear caster seems to be unknown in Asia, Africa and Europe, but it is used by the Esquimax, and by one of the Brazilian trites.

The arrow follows naturally after the smaller spear or javelin—indeed, the only way in which it can be distinguished satisfactorily is by the presence at the hinder end of a notch for the spring; for, though generally feathered at the end, many are bare. The bow and arrow, though very generally distributed, are not universal. The Australians and New Zealanders were entirely ignorant of them, nor are they used by the Caffres. The neighboring Bushmen on the contrary, rely principally on their bows and arrows, which, though weak, are formidable, because poisoned. The form of the bow varies very much. In the south it is said to be much longer than in the north; among equestrian races it is natually much shorter than among those who go on foot. Among savages the arrows are very carefully made, because a bad shot often involves two or three days labor. Although the gun is gradually superseding the bow, still the latter possesses certain advantages, as it makes no noise, therefor does not frighten the game so much, and is lighter to carry. There is, moreover, a kind of arrow which is not used with a bow, but with a blow pipe, usually from six feet to sixteen feet long. These weapons occur in Sumatra and in the neigboring islands, also in South America, but not in Africa. In Western Europe it is represented by the pea-shooter.

The first traces of art with which we are acquainted began at a very early period, and have been found in a manner quite unexpected. Among the remains of a man discovered in the French caves, and belonging to the reindeer period—that is to say, at a time so early that the reindeer was abundant in the south of France, and when possibly—though on this point there is much doubt—even the mammoth had not entirely disappeared, simple carvings and etchings have been discovered giving unmistakable representations of animals. These works of art are sometimes sculptures, if one may so say, and sometimes drawings made on bone or horn with the point of a flint. They are of peculiar interest, being of far more ancient date than even the monuments of Assyria and Egypt. There are those who express surprise at the skill shown in the drawing of savages, but there is no reason why a savage living unknown ages ago should not draw as well as a child of to-day.

Sir John Lubbock then proceded to describe at some length the skill in carving exhibited by many savage tribes. He also pointed out that some savages have no ideas of art, and cannot understand a picture when it is shown to them. He added that it is somewhat remarkable that while in the reindeer period we find very fair drawings of animals, in the latest part of the stone age, and throughout that of bronze, they are almost entirely wanting, and the ornamentation is confined to various combinations of straight and curved lines, and geometrical patterns. This he believed would be eventually found to imply a difference of race between the population of western Europe at these different periods.

MORE ABOUT SUBMARINE EXPLORATION.

Our description of the submarine apparatus now being used in the attempted recovery of treasure from the wreck of the frigate *Hussar*, has given rise to inquiry for further information upon the subject. We herewith give an account of the commencement of submarine exploration, and its progress up to the present time. As we said in our former article, diving without the use of apparatus was the beginning, and it dates back to a very early period. Homer, in the sixteenth book of the Iliad, describes Patroclus as taunting Hector's charioteer for falling from his horse when he was slain, as a diver goes into the sea to bring up oysters. Other references to diving are to be found in ancient works. Thucydides speaks of the employment of divers to saw off stockades driven into the bottom of a harbor to prevent Greek ships from entering. Livy gives an account of their employment for the recovery of treasure and merchandise. The story of Antony's fishing and bringing up a salt fish attached to his hook by a diver employed by Cleopatra, is a familiar one. The first attempts to aid divers in their descent, were confined to such rude devices as bladders placed over the mouth and weights to help them to descend and remain more easily. In Pliny's time divers used a long pipe with a floating funnel to enable them to breathe under water while engaged in the operations of ancient warfare. In 1252, Bacon, in his "Discoveries of the Miracles of Art, Nature, and Magic," says: "A man may make an engine whereby without any corporal danger, he may walk at the bottom of the sea or other waters." Like many other hints which were thrown out by Bacon and which have found their interpretation since, in the great inventions which have succeeded them, this was unaccompanied by any detailed description.

The real history of devices for submarine exploration dates from the sixteenth century. From that time to the present, there has been gradual improvement in this art. Not the least meritorious of the inventions which have been made belong to our own time and country, but of them anon.

As all the devices for submarine navigation have hitherto met with little or no success, we shall pass them without remark, and confine ourselves to those devices which have had for their object the simple descent and continuance beneath the surface in safety and comfort. These devices have, comparatively speaking, only lately begun to assume a form approaching perfection. The earliest mention of a diving bell that we can find is in "Beekman's History of Inventions." He says that in the sixteenth century, in the presence of the Emperor Charles V., and several thousand spectators, two Greeks let themselves down under water in a large "*inverted kettle*" with a burning light and rose again "without being wet." In the latter part of the fifteenth century, some attempts were commenced to recover from the Spanish Armada, the treasure which was lost at the time of its disaster near the Island of Mull in the Hebrides, but without success only three guns being recovered. In this attempt a bell was used devised by the Marquis of Argyll, to whom the British Government pledged all the treasure he should succeed in recovering.

In 1680, William Phipps invented a square box of iron with windows and a seat for divers, with which the Spanish treasure was again sought. After having once failed he was assisted by the then Duke of Albemarle, and succeeded in finding and recovering treasures to the value of $1,000,000 in gold. For this feat he was knighted. In 1683, Sinclair, the mathematician, published a series of calculations relating to the size of a bell necessary to contain air for a given number of men for a given period, and the proper thickness and shape of its walls to withstand pressure; the depth to which bells of certain construction could safely descend, etc. These calculations were of the greatest value to the advancement of the art. In 1775, the celebrated Dr. Halley contrived a way for supplying air to a submerged bell, by sinking a number of barrels filled with air to the bottom, which was transferred to the bell by means of tubes and cocks, an escape-cock being placed at the top of the bell. With this apparatus, slightly improved, Mr. Spaulding and an assistant attempted to recover the cargo of a vessel wrecked on the coast of Ireland, but by some means they were unable to obtain a supply of air from the barrels and were suff cated. Smeaton was the first to supply air to bells by the use of forcing pumps, and since his time the air pump has been constantly used in similar attempts. We have not space to give in detail an account of the progress of improvement in diving bells in other countries since Smeaton's time. Some very efficient submarine armor has been devised, to which we referred in our former article, together with some difficulties which cannot probably be obviated in this class of devices.

These inventions have, notwithstanding, proved of great service in submarine engineering. In the early part of the present century by the use of a modification of Kleingert's armor, Tonkin recovered treasure from the Abergavenny, sunk near Weymouth, amounting to $300,000.

We are indebted to Dr. J. A. Weisse for the following particulars of the most recent improvements in diving bells.

"The *Nautilus* Diving Bell, exhibited at the Crystal Palace in New York, was an improvement on all previous diving bells, having within its walls a working chamber, an air chamber, and a ballast or water chamber. The able engineer, William Mont Storm, improved the *Nautilus*, whose patent expired some years ago.

The *Ryerson* Diving Bell, patented October 19th, 1858, had like the *Nautilus*, a working chamber, an air chamber, and a ballast or water chamber with some improvements. In this bell, Otto Sackersdorf, engineer of our Street Department for twenty years, blasted and removed 2,100 cubic yards of Diamond Reef and opened the channel between Governor's Island and Brooklyn.

In a written statement of October 6th, 1864, Mr. Sackersdorf speaks thus of the *Nautilus*, *Maillifert's* Bell, and of the *Ryerson* Bell: "The *Nautilus*, although a decided improvement, has not verified its promises. I have tried it at the Navy Yard in 1854. It does not work independently from the surface and uses too much air.

"*Maillifert's* Bell has some good features for stationary work, but it is immovable and very dangerous on account of its funnel or man-hole. Absolutely impracticable for any depth of water, say twenty-five or thirty feet or strong tide.

"The *Ryerson* Bell carried about four atmospheres of pressure in the chambers, and its lifting power was up to eight tuns. Heavy rocks were taken and dropped in deep water. The bell was independent of anything above water (signal-line excepted), and carrying the means of respiration and motive power in itself; remains any length of time below, or descends or ascends with any velocity you choose. Twenty seconds were more than enough to descend twenty-five or thirty feet. The old fashioned bell required on the same spot sixteen minutes, not mentioning the slow and dangerous mode of entering or leaving. Suffice it to say, that our bell had about nine feet of diameter inside. Five men had ample room to work in. They experienced no difficulty whatever and changed but once a day with the gang on board the vessel above. Any man of common sense can be easily instructed to work the apparatus, so simple is the arrangement therefor. A leak is at once indicated by the barometer. and by this means all danger of drowning made impossible."

William Mont Storm's "Improved Submarine Explorer," to which the Patent Office, May 1, 1866, granted eight new claims of improvement over all its predecessors, has been still further improved by Mr. Wm. R. Taylor.

A report of the principles involved in these bells and of the uses they may be applied to, by Wm. W. W. Wood, chief engineer of the United States Navy, may be found in the Navy Department, dated February 2, 1865. Admiral Farragut, looking at a drawing of the Improved Submarine Explorer, observed that naval warfare would soon be carried on as vigorously under as above water.

With this bell, as we stated in our former article, an engineer and four men with provisions, lights, and working tools of every kind, can descend to certain depths of fresh or salt water, work at wrecks, blast rocks, remove harbor obstructions, lay foundations for wharves, piers, docks, lighthouses, bridges, sea walls, fortifications, and repair the same with almost as much facility as on *terra-firma*. Thus millions of wrecked treasure and merchandise might be raised, and all the Scylla and Charybdis, Hell Gates, and Cliffs, so much dreaded by mariners, might be widened, deepened, and cleared all over the world.

Weight of the Air.

The air is composed of two ingredients, not in combination, but as a mixture, like wine and water. These ingredients are oxygen and nitrogen. They exist in the proportion of 23 of oxygen to 77 of nitrogen in 100 parts. Besides these, the air contains of carbonic acid about 3 parts in 10,000. Our atmosphere is estimated to contain about 1,954,578 cubic miles of oxygen. The respiration of man and animals, together with the combustion of fuel, consumes annually about 2½ cubic miles; consequently 250 cubic miles in 100 years, or only a 10,000th part in this time. The above paragraph reveals even more wonderful facts; a single perusal of it is sufficient to suggest questions of a most startling character.

Thus it appears, that in the course of ages, say 1,000,000 the supply of oxygen would be exhausted, and its beneficial place taken by carbonic acid, generated by respiration and other forms of combustion. But such was not to be. Let us for an instant consider the revelations of geology. It tells us that ages before the creation of man, the atmosphere contained a larger proportion of carbonic acid than it does at the present day. The question then arises, what has become of it? Let us dig into the earth till we discover coal; we then find our answer. The excessive carbonic acid of the early atmosphere has been converted into coal—coal, the remains of trees, which, in their lifetime, possessed the power common to all living plants, that of decomposing carbonic acid; depositing within their cells the carbon, and returning to the air its oxygen, for carbonic acid is only composed of carbon and oxygen.

What does the air weigh? Nothing, many will answer. But this is a great mistake, for every 100 cubic inches of air weigh slightly more than 31 grains. A cubic yard of oxygen weighs 2 lb. 4 oz. 7 dr. Such being the case, a cubic mile of oxygen weighs nearly 5,543,623 tons 10 cwt. By another multiplication sum it is easy to show that the whole of the oxygen in the atmosphere weighs 10,835,444,533,383; and, since the oxygen and nitrogen of the air exist in the proportion of 23 of the former to 77 of the latter, as before stated, the total weight of nitrogen of the air is the amazing amount of 36,275,183,872,630 tuns, while the total weight of the air, which is the result of the addition of these two quantities, yields the astonishing quantity of 47,110,628,406,013 tuns.—*C. H. Piesse.*

Mock Sun and Mirage.

About this time, last year, a mock sun was visible from Dover. This is a very rare phenomenon, and results from a reflection from clouds in the eastern horizon of the setting sun in the west, there apparently being two suns in the heavens at the same time. The atmosphere of the straits of Dover seems to produce these strange appearances in the sky, for a mirage was lately strikingly conspicuous at Dover. The dome of the cathedral and Napoleon's Pillar at Boulogne were to be seen from the Crescent Walk by the naked eye; but with a telescope of ordinary power the entrance of the port, its lighthouse, its shipping, and the surrounding houses, the valley of the hillside of Capecure, and the little fishing village of Portel were distinctly visible; while on the eastern side the principal features of the country, the lighthouse of Cape Grinez, the adjacent windmill, numerous farms and villages, with their windows illuminated by the setting sun, stood out with extraordinary clearness. While these were under observation, a locomotive was seen to leave Boulogne and travel some miles in the Calais direction, by its puffs and wreaths of white steam. Shortly after sunset the mirage subsided.—*C. H. Piesse.*

Movements of the Sensitive Plant.

M. Bert and M. de Blondeau have published in the *Comptes Rendus* some extremely interesting observations on this subject. M. Bert shows that the natural and regular movements of the leaves, which take place in the sensitive plant, are produced by a different cause from that to which the sudden, contraction is due when the plant is touched by the fingers. M. de Blondeau's observations are exceedingly curious and well worth further examination. He submitted three plants to the influence of an electric current from a Ruhmkorff coil. The first he acted on for five minutes; when left to itself, the plant seemed prostrated, but after a quarter of an hour the leaves opened and it seemed to recover itself. The second specimen was acted on for ten minutes. The plant was prostrate for an hour, after which it slowly recovered, The third specimen was galvanized for twenty-five minutes. but it never recovered; and in twenty-four hours it had the appearance of a plant struck with lightning. A fourth plant was etherized and then exposed to the current. Strange to say, the latter had not any effect: the leaves remained straight and open; thus proving, says M. de Blondeau, that the mode of the contraction of the leaves of the sensitive plants is in some way allied to the muscular contraction of animals.

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POLYTECHNIC COLLEGE OF PENNSYLVANIA.

Reported for the Scientific American.

The Annual Commencement of this well known seat of technical education was held in the new and spacious Horticultural Hall, Philadelphia. It was attended by a large audience, comprising many of the leading manufacturers, iron masters, and officers of railways and mines, not only of that city but of the interior of the State. On the stage were grouped leveling and transit instruments, models and apparatus symbolical of architecture, mining, chemistry, and civil and mechanical engineering.

During the performance of a march by the Germania Orchestra, the procession, consisting of the Trustees and Faculty of the College, the reverend clergy and other other invited guests, the alumni association, and members of the graduating and other classes of students, entered the hall, and advancing to the stage, took the seats assigned them. The Hon. John P. Vance, President of the Board of Trustees, announced the order of exercises, which were opened with an impressive prayer by Rev. Phillips Brooks, Rector of Holy Trinity Church, Philadelphia. The introductory address was delivered by Gustavus Remak, Esq., who drew a vivid picture of the great undeveloped industrial resources of the country, north, west, and south, and pointed to the polytechnic system of education as the true and proper means whereby such development may be economically secured. Graduates under that system in Europe were chiefly relied on as directors of her great industries, and now that the system had been successfully transplanted to America, those educated with its advantages were found to be most worthy of confidence, and were therefore more and more in demand. He then traced the history of the Polytechnic College of Philadelphia from the date of the incorporation fifteen years ago, and closed by congratulating the officers and students upon its steady and prosperous career. The recent establishment of the Preparatory School, which he said was the first American "*Realschule,*" he hailed as another step toward the attainment of a high standard of polytechnic education in this country.

The degrees of the college were then conferred by the President of the Board of Trustees upon the gentlemen whose names are appended.

The charge to the graduates was delivered by Hon. Titian J. Coffey, whose address was a powerful and convincing argument in behalf of scientific education and against the too exclusive study of the dead languages, which now characterizes the usual college course. That course had remained unchanged for centuries. Meanwhile the labors of the learned had created the natural sciences. Skilled experimenters and artisans had discovered and invented, remodeling the material earth and elevating man. Yet the so-called classical course practically ignored all this progress and denied to its students that robust mental discipline which, severe though it be, the young investigator of modern scientific truth enjoys, as he feels it indeed to be the best training for the sharp conflicts of life. His observation is made acute, and from the habitual determination of the nicer characters of his specimens, he gradually learns to discriminate between men. His imagination finds scope in the theories of chemistry and the study of the imponderable forms of light, heat, and electricity, and his reasoning powers are matured as he solves the sublime problems of terrestrial and celestial mechanics. Mr. Coffey denied that the classical course was the best training for the literary man, and cited in proof a list of the most vigorous, powerful, and influential writers and thinkers of modern times, and adduced the testimony of the first educators and scientific men of Great Britain in behalf of his position. In his closing charge he spoke of the great cause which the graduates had to be proud of the college, and instituted a comparison between their advantages and those of European graduates.

The following is a list of the graduates, of the technical schools in which they studied, and the subjects of their graduating theses:

I.—SCHOOL OF MINES.

DEGREE OF BACHELOR OF MINE ENGINEERING.

1. Edward H. Hughes, Newbern, N. C. Origin and Use of Coal.
2. Samuel Hunt, Carasauqua, Lehigh county, Pa. Preparation of Ores.
3. William Jolliffe, Virginia. American Silver Amalgamation.
4. Richard Lewis, Trevertown, Northumberland county, Pa. The Ventilation of Coal Mines.
5. Gratz Mordecai, Philadelphia, Pa. Preparation of Fuel.
6. Gilbert R. Van Alen, Danville, Montour county, Pa. Metallurgy of Iron.

II.—SCHOOL OF MECHANICAL ENGINEERING.

DEGREE OF BACHELOR OF MECHANICAL ENGINEERING.

1. Murray Bacon. On Lubricants.
2. Harry B. Salkeld, Mauch Chunk, Carbon county, Pa. The method of Constructing Steam Boilers.

III.—SCHOOL OF CIVIL ENGINEERING.

DEGREE OF BACHELOR OF CIVIL ENGINEERING.

1. John Israel Bishop, Columbus, Burlington county, N. J. Tubular Bridging.
2. Alfred Augustus Curtis, Newark, New Castle county, Del. Underwater Foundations for Bridges.
3. Henry Freedley, Jr., Norristown, Montgomery county, Pa. Iron-girder Bridges.
4. Benjamin P. Howell, Jr., Woodbury, Gloucester county, N. J. Limes, Mortars, and Cements.
5. Samuel H. Ladd, Woodbury, Gloucester county, N. J. Ventilation of Buildings.
6. Herman H. Mund, Philadelphia, Pa. Stone Masonry.
7. Emilio V. Munoz, Santiago, Cuba. Construction of Canals
8. F. H. Oliphant, Jr., Spring Hill Furnace, Fayette county, Pa. Tunneling Through Rock.
9. Amos M. Shuster, Frenchtown, N. J. Construction of Roofs.
10. Joseph E. Thropp, Valley Forge, Chester county, Pa. Detaching Rock.
11. B. B. Van Dusen, Knoxville, Tioga county, Pa. Permanent Way.
12. Rowland Whitman, Philadelphia, Pa. Suspension Bridges.
13. A. D. Wright, Farmington Center, Tioga county, Pa. Common Roads.

The Master's Degree was conferred upon the following graduates of three year's standing:

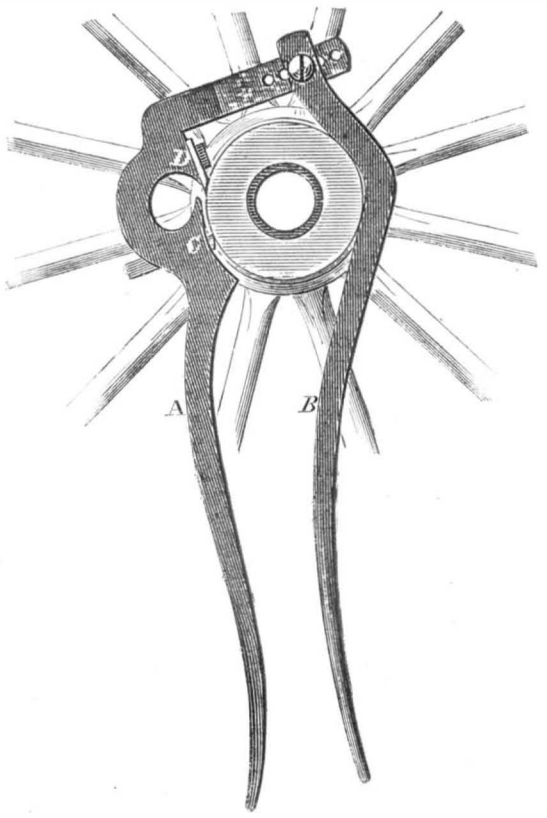
Master of Mine Engineering, on Price Wetherill, mining engineer, Mahonoy City, Pa.

Masters of Civil Engineering—Jonathan R. Jones, C. E., Conshohocken, Pa.; Henry H. Corson, C. E., Plymouth, Pa.

THE Scientific Association at Chicago adjourned on the 12th inst., after the usual resolutions of thanks to all concerned, and the election of Prof. J. W. Foster, of Chicago, as President of the next meeting, to be held August 16, 1869, by invitation, at Salem, Mass.

STONE & HEBBERT'S PATENT TOOL FOR FITTING HUB-BANDS.

The simplicity of this tool is such that the practical carriage maker or wheel-wright will understand at once its action and operation, by an examination of the accompanying illustration. It is intended to save the clipping with mallet and chisel usually practiced to fit the hub of wagon wheels to the band. The implement consists mainly of two handles, A, having a right-angled arm to which B is pivoted by means of a bolt. B is sufficiently bent to bear at two fixed points on the perimeter of a hub, whether it be large or small, and A has also a concave face for the same purpose. To further adapt the instrument to varying diameters, the handle, B, may be set nearer to or further from the other by shifting its pivot bolt, for which purpose the arm of A is furnished with



a series of holes. C is a marking or scribing cutter, and D, a chisel; both adjustable by means of set screws and slots. In operation the wheel is swung and revolved while the work, man holds the tool on the hub.

Patented through the Scientific American Patent Agency July 14, 1868, by Charles E. Stone, Amesbury, Mass., and Alfred Herbert, Salisbury Mass. For the entire patent, State rights, or further particulars, address either of the patentees, box 163 Amesbury, Mass.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

The Union Pacific Railroad Company.

MESSRS. EDITORS:—Have you space for a brief article upon the Union Pacific Railroad, and the country which it traverses? I am prompted to write this for your columns, because, having recently traveled over that railroad for a distance of seven hundred miles west from Omaha, and having seen every mile of it by daylight, I am qualified to speak somewhat strongly of its character, and to emphatically deny some of the charges that have been made against it. I was one of the editorial party of thirty who have recently returned from the end of the line, and who were given the fullest opportunity possible for thorough investigation into the construction and management of the road.

I have spoken of charges made against the character of the road. Evidently some of these charges are prompted by prejudice, and more by utter ignorance of the subject. It is not long since a prominent newspaper published a letter of complaints against the Union Pacific Road, the strong points of which were that the bridges were made of pine! and were actually built without arches! The blundering letter-writer was right—the bridges *are* built of pine, which you know to be the best bridge timber in the world, and every one of them is a Howe truss bridge, whose peculiar strength lies in the fact that there is not a sign of an arch about it. I have now before me two letters published in a Brooklyn paper, evidently written by one person. These have sundry charges against the Union Pacific Railroad, a part of which are frivolous, and others more tangible. Let us see what foundation the writer has for his denunciations.

A large part of the letters is taken up with sneers at "dead-heads," who go over the road at the expense of the company, and are charged with being thereby bribed to tell a flattering tale I suppose he would include our whole party under that head, because we were invited by the agents of the railroad company; so let us see what our circumstances were Every invitation to join the party said, in substance, "send some gentleman of sound sense and good judgment, who can state clearly the condition of things as he sees them, and who can criticise intelligently, if he finds occasion to do it at all." In response to this invitation, we had gentlemen of a standing and repute not to be bought up with good eating or comfortable quarters, if such a thing had been desired. Then, the gentlemen in charge of the party, and who represented the railroad company, took a special train from Omaha, which went fast or slow as was desired, which stopped whenever it was desired by the guests, to examine the road or its surroundings, and which passed over the entire line by daylight, either going or returning. Hence the members of the party had a far better opportunity for seeing the exact character of everything pertaining to the road than the writer referred to, or any traveler by ordinary trains could have. What was the verdict? Hon. Charles A. Dana, editor of the New York *Sun*, is a credible and responsible witness; and he speaks the sentiment of the entire party when he says:

"Their unanimous opinion is, that the road is constructed in the most thorough and solid manner, and that it is superior in firmness, smoothness, and capacity, for rapid running, to any other new road which they have ever seen. The work is well done, both as respects the judgment with which it is laid out, and the thoroughness of its construction; and there is no part of it which could, under the circumstances, be better than it is. All reports to the contrary are erroneous and mistaken."

The critic referred to says that he anticipated seeing "marvelous cities, beautiful villages, and delightful settlements," all along the line, and seems to have been surprised to find a congregation of bad characters at Cheyenne. Then, he must have known less of the inevitable character of a new country than men of ordinary sagacity. To expect to find New England or eastern Pennsylvania towns in a region just opened to civilization, one or two years ago, shows a credulity which deserves disappointment. But Cheyenne, Laramie, and Benton, *have* successively deserved the title of "marvelous cities," or villages. Theirs is not a pleasant nor an attractive growth to an eastern man; but Omaha on the one side, and San Francisco on the other, have both passed through similar experience, before law and order succeeded the reign of vice and violence. For one, I have never yet seen any description, even from a "dead-head," of these places, which represented them to be the abodes of peace. The tendency has invariably been to exaggerate their lawlessness, and make the hair of a timid man stand on end at the thought of visiting them.

In regard to the road itself, the paragraph I have quoted above expresses just what we all felt after thorough examination. On our return, we made the run from North Platte to Omaha, a distance of two hundred and ninety miles, at an average rate of over thirty-four miles an hour, and ran fifty-five miles in one hour. No railroad officer in the country would dare do that, or suffer it to be done upon his road, if the latter was not in splendid condition. This portion of our trip was made with as much comfort to us as any other part of the whole run from New York to the Rocky Mountains; and I claim that this one fact will convince any candid man that it is a gross libel to speak of "the miserable and absolutely unsafe manner in which the road is constructed." Here are some of the details of construction: The iron is of the very best American manufacture; the ties number 2,650 to the mile (the average upon the railroads of the country is about 1,700); the rails are all joined by "fish-plates," of a pattern approved by the best railroad engineers; the road is being ballasted with broken stone brought from the Black Hills; the culverts are now made of substantial timber, which would be good for ten years' wear; but the contract is already made for immediately replacing them with heavy dressed masonry. The equipment of the road is superb. The locomotives are of the best Taunton, Providence, Trenton, and Paterson make; while the freight and passenger cars, which are turned out from the company's own magnificently appointed shops at Omaha, are equal in every respect to any that I have ever seen in the course of many years' active traveling. These shops, by the way, cover eight acres of ground, and are manned by about one thousand intelligent artisans, who have all the advantages that the most perfect tools and machinery can give them.

The perfect, almost military discipline, which pervades all the vast operations of the company, is noticeable and pleasurable. Especially is this apparent at the end of the track, where four hundred men are engaged in the track-laying, where every man knows so exactly his place in the grand human machinery, and so promptly and energetically fills it, that no possible improvement can suggest itself. It would take more words than you have space to print, to adequately describe this wonderful march to the western sea.

But I must stop. The theme is inspiring; but there remain all the future ages in which to recount the worth to the country of the Union Pacific Railroad, and the honor due to those men of brains and energy, and indomitable pluck, who have conceived and are so grandly executing this national undertaking.

Let me close with another quotation, this one from the practical, unimpulsive Baltimore *American:*

"It is proper to say, just here, that the rumors which have been put afloat at the east, that the company is a party of speculators putting down a rude and poorly constructed road, that will be useless, or nearly so, when completed, are falsehoods which could have only been concocted and put in circulation for purposes that would scarcely bear examination. The road is a good one, well and solidly laid, with heavy rail, and twenty-six hundred cross-ties to the mile, over which the cars travel with remarkable smoothness; and the equipments, station-houses, and work shops, all show that it is being built for use and not for speculation."

S. D. P.

Algebra---Mathematics for Mechanics.

MESSRS. EDITORS:—In your issue of the 5th inst., I was quite surprised at the remark of Mr. Horace Greeley on the study of algebra, and quite indorsed your opinions on the subject. Any one who knows anything of the study of mechanics, must know that a previous knowledge of geometry and algebra is indispensable to acquire its principles. But, laying aside the question of its after utility, to say its study will clog the brains, is an assertion, which, I think, the writer would retract after mature consideration; for the more one studies, the more is the capacity of the brain for storing

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knowledge increased,and the more subjects are opened to one's view as he proceeds, he feels his ignorance,and is thus nerved for stronger efforts to gain the upper branches of the tree of knowledge. In the majority of schools, boys are taught geometry before they have chosen a profession, because it teaches them to reason logically, and expands the mind by causing them to use their common sense; and in the same manner algebra shows them how labor is saved and time gained by the use of symbols, and by preserving a method in all their work, so that if they do not require a knowledge of these subjects in after life, they will have improved the mind so as to ever benefit them. In preparing engineers for the British navy, the plan adopted is, to see that they have a thorough knowledge of geometry and algebra, and with this good groundwork to build on, they take trigonometry, mechanics, and chemistry, hand in hand, as they advance taking the higher branches of mathematics, so that in the end, they have often as good a knowledge of all branches of mechanics as those who have studied at the universities. At the same time, they have a complete knowledge of practical engineering, which, together with the theoretical, makes them fully fit for their arduous duties at sea. J. H. Rickard.

Clifton Springs, N. Y.

Electro-Magnetism as a Motive Power.

Messrs Editors:—I notice in the Scientific American of July 8th, under the head, "The Impossible in Constructive Science," a well written article from the *Engineer*, in which "Electro-magnetism as a motive power" seems to be very summarily disposed of. Believing that the ideas set forth in said article are calculated to have a tendency to check the ardor of some who are endeavoring to produce a motive power safer and in all respects more desirable than steam power, I propose, with due deference, to offer a few remarks.

Engineer says that "we now know that nothing can be expected from electro-magnetism as a motive power," and that "all the power which an electro-magnetic engine can produce is represented by the oxidation of a given weight of zinc." But what electro-magnetic engine? Henry's, Page's, Vergne's, Wickersham's, or Stewart's? Because each of these will give a different result with a given current. Could the power of steam be definitely ascertained by experimenting with the engines of Hero of Alexandria, Blasco de Garay, the Marquis of Worcester, Denis Papin, Captain Savery, or even of Newcomen? And yet the power of steam was as great 1,000 years ago as to-day. The arrangement of James Watt simply developed a greater percentage of the power of steam than those of his predecessors. Now it is highly probable that the best electro-magnetic engines do not develop one per cent of the electro-motive force, and are in fact mere whirligigs, like the æolipile, showing something of the velocity with but little of the force of the current.

Engineer says it is far more economical to burn coal to store up power in water than to burn it to store up power in zinc. Now the electro-magnetic force is derived from the oxidation of pure zinc, which is obtained from the ore by the combustion of coal. The duty performed by the coal being simply to drive off (not store up) foreign matter, and not oxydize the zinc—a pound of pure zinc giving the maximum of electro-motive force, the combustion of coal being at the minimum (or rather, nothing). So that it is easy, even for an unlettered man, to see that there is no connection or relation whatever between the power represented by the oxidation of a given weight of zinc and the coal necessary to produce the zinc from the ore.

Engineer says "that the discovery of the conservation of energy dashed the hopes of the inventor to the ground. "But why so? What is the amount of coal necessary to oxydize one pound of zinc? Zinc melts at 773° Fah., and at a considerably higher temperature passes off slowly in the form of vapor. More than one hundred pounds of coal would be required to oxydize one pound of zinc, equal to twenty-five horse-power per hour. But again, Miller, in his work on electricity and magnetism, states that, "from the experiments of Weber it may be calculated that if the whole of the positive electricity required to decompose a grain of water were accumulated upon a cloud 1,000 meters (3,281 feet) above the surface of the earth, the attractive force exerted between the cloud and the portion of the earth beneath it would be equal to 1,497 tuns." Now, to decompose one grain of water, 3 63 grains of zinc are required, and the electricity derived from a pound of zinc and situated as above would give an attractive force of 2,384,742 tuns! John Clark.

Removing Shellac from Watchmakers' Lathes.

Messrs. Editors:—A speedy mode of dissolving shellac upon watchmakers' lathes is needed. The article turned is taken off by the heat of a lamp, and some substance, liquid or solid, which would, with or without heat, soften the shellac, so that it could be quickly removed with the brush, would be a desideratum. Alcohol is used, but it is too slow.

Pa. S. T. S.

[We know of no ready solvent of shellac that will not act chemically upon metals, except alcohol. Shellac dissolves easily in dilute muriatic and acetic acids. By the aid of heat it is also easily dissolved, by a solution of borax If any of our correspondents know of anything better than alcohol, we shall be glad to hear from them.—Eds.

Mode of Dividing Glass.

Messrs. Editors:—The following plan, to break a bottle or jar across its circumference, so as to form a battery cup or vessel for other purposes, may be of some service to your readers. I have performed the operation successfully many times Place the bottle in a vessel of water, to the height where it is designed to break it; also fill the bottle to the same level. Now pour coal oil inside and out on the water; cut a ring of paper, fitting the bottle. Saturate with alcohol or benzine, so that it touches the oil. Pour, also, some inside the bottle. Set on fire; the cold water prevents the glass from heating below its surface, while the expansion caused by the heat will break the vessel on the water line.

J. T. Peet.

Physical Strength.

The common idea in regard to physical strength is that it depends solely upon the amount and quality of muscle, bone and sinew. In the training of athletes for the performance of physical feats the prominent features are the means for development of the muscular tissue and the inuring of muscles to severe work, so that the soreness which results from the extraordinary exercise of the body not thus inured, shall no longer be a sequence of physical exertion. This is right so far as it goes. Development of muscle, strength of bone, and firm elastic sinews are essential elements of strength as well as endurance, but they are by no means all. Were that the case, strength could be estimated by weight approximately. But the facts are that many small men having no superior training or no better apparent health, have often been more than a match for larger men. The strongest man with whom we were ever acquainted, never weighed over one hundred and fifty pounds. We might tell some large stories of the feats of this remarkable man, but the point which we wish to make will be sufficiently illustrated without any such particulars. The peculiar feature which always forced itself upon our attention when he was powerfully exerting himself was his perfect placidity of countenance, and the want of that turgid congested appearance of the face which often accompanies such exhibitions. Further the muscles not specially employed never exhibited rigidity, as is often seen in feats of strength, but were soft as though he were reclining at his ease. Except he was doing some labor which caused much motion of the muscles of the chest, he never appeared to be "winded," as it is called.

We have often set ourself to the solution of the reason of the different degrees of strength possessed by different individuals, or rather, we have attempted to get at the secret of strength which lies back of bone and muscle, and we have no doubt it is the peculiar exercise of the will: the concentration, so to speak, of the nervous energy upon one muscle or set of muscles, without the distribution of it to muscles not concerned in the act to be accomplished. This was proved in the case alluded to by the fact that in feats which involved the exercise of nearly all the muscles, his power was not so perspicuous. In special feats, as for instance the raising and sustaining a heavy weight at arms length, his great strength, and also the concentration of will to which we have alluded was most conspicuous. This man's strength was undoubtedly to be attributed to his shortness of limb in some degree as, with equal development of muscle increased length of bone is a disadvantage. Each bone in the animal frame is a lever, and the muscles are so attached that the motion they impart to the bones is multiplied through its transmission by them to weights or resistances. Too great length of bone in proportion to amount of muscle is not conducive to superior strength although it adds to fleetness. The differences in the structure of the bulldog and the greyhound are good illustrations of this fact.

The elements of physical strength may then be stated to be in healthy subjects, development of muscle, strength of bone and sinew, small relative length of bone in proportion to muscle, and power to concentrate exclusively upon the muscles employed the nervous energy which produces contraction. There is no doubt that this power can be cultivated, like other powers by proper discipline; and if those who are obliged to lift heavy weights or to make other great exertion at times, would bear this in mind, they would be enabled to accomplish their labor with less exhaustion than is at present the case. The view here taken of the concentration of will seems to be sustained by the opinions of the eminent chemist and physiologist, Liebig, who states that it is just as impossible by the combustion of a piece of dried muscle to calculate its efficiency in the living body (the assumption of some physicists), as it is by the combustion of a dried bee to estimate the work which it accomplishes in its flight of many hours, carrying the weight of its own body several miles.

The muscle in a living body acts like the apparatus in a watch which gradually expends the power stored up in it; a freshly severed frog's leg represents an apparatus of this kind with an escapement, while the newly removed heart of the same animal corresponds to one without any escapement; the frog's heart beating for hours together just as in the living body, while the frog's leg moves as soon as an irritant sets it for a moment free from the escapement, and if small weights are hung on them, it is possible to obtain work from a pair of severed frog's legs; that is, the weights will again and again be alternately raised to a certain hight, without blood or the supply of any kind of nutriment.

It would seem from these statements that the muscles are ta be considered merely as vehicles of a force which is imparted to them. This force—the nervous energy, whatever that may be—must of course become sooner exhausted, and also lose in immediate efficiency by being distributed to muscles not required for the performance of any specific work.

The Chicago Savans.

The American Association for the Advancement of Science, out of gratitude for the hospitality shown them by the citizens of Chicago, admitted to membership some two hundred prominent business men, lawyers, hotel keepers, pork packers, and so forth. A writer in the Chicago *Tribune* makes this a subject of sport in a very humorous "take off," in which these gentlemen are regarded as professors, reading papers upon the subjects peculiar to their several occupations. We extract the following, which show the satirical humor of the article:

"In looking over the list of the Chicago *savans*, who can help being proud of the contributions they will make to the scientific knowledge of the world at their first meeting, the record of which will undoubtedly appear in the daily press somewhat after the following fashion:

"The session of the American Scientific Association was one of peculiar interest, from the large number of essays which were read. Professor Jerome Beecher read a paper on the relations between gas and dividends, showing that the pre-historic man never received any profits from its illuminating properties and that Solomon was quite irregular in paying the gas bills of the Temple.

"Professor Edward Ely then occupied the attention of the association with a paper upon coats and neck-ties, illustrated with diagrams, in which he proved conclusively that the automicity of the torso of a coat (that is, a coat without a tail or sleeves), was equivalent to one atom of an element in a coat with a tail, united to one or more atoms of a second hand coat; and that the moral influence of the fluctuations of a neck-tie upon a well regulated mind could hardly be computed.

"Dr. Clinton Briggs gave the algebraic formula, starting on the basis of x. which keeps Merchants' Union stock at 24. This view was also corroborated by an able paper read by Professor C. B. Farwell. Professor C. M. Cady delivered an oral argument proving that a Steck piano had been dug up underneath the skeleton of a mastodon in an alluvial formation, and that the skeleton of an aborigine was seated at it From the position of the petrified fingers on the keys, he had discovered a chord in the touching song 'Let me kiss him for his mother,' thus proving the immense age of this ballad.

"Dr. George H. Dunlap, N. W. R. R., read an essay on the coming railroad from Chicago to the moon. He stated that Professor Perry H. Smith would probably locate himself at the moon terminus, to see that its perturbations did not affect the stock, and he had no doubt, moreover, that as soon as they settled the uncertainty relative to the moon's semi-diameter the stock would be at a premium. Telegraph stations would be under the control of the man in the moon—not Professor Smith, but the other man—and the stockholders would be given a free annual ride to the octants in the orbit, corner lots in which were now for sale.

"A recess was then granted, and the association lunched at the residence of Professor Dr. Dyer. During the informal conversation reference was made to the old slow coach days when Chicago had but one *savant*—the late Colonel Graham—and the famous Dyer story was revived. At a dinner party Dr. Dyer sat next to Colonel Graham. In response to a toast the Colonel arose and after paying his respects to the company, said he had an important discovery to make known. He had labored upon it for years, and had now arrived at the conclusion, after long scientific explorations and many anxious nights of study, that there was a tidal wave in Lake Michigan of at least one third of an inch. Dr. Dyer, who was sitting next to the Colonel, sprang to his feet and exclaimed, in utter amazement, 'Good God! Colonel, you don't say so. I always thought there was something the matter with that cursed lake.'"

Oxyhydrogen Light.—The experiments commenced last year on the Place de l'Hotel de Ville, in Paris, on the oxyhydrogen light, are about to be continued by order of the Emporer, in the court of the Tuileries. The magnesia cylinders having been found to corrode and waste away too rapidly for the purpose of a continuous light, an artillery officer, M. Caron, after experimenting with a variety of substances, has adopted zircon, a substance which Berzelius pointed out as infusible, and giving forth a very brilliant light under the blowpipe. It is said that M. Caron has had a cylinder of this substance in use with the oxyhydrogen light for a month without the slightest trace of volatilization. The luminous power of zircon, under the oxyhydrogen jet, is about one-fifth more than that of magnesia. The zircon employed is an oxide of zirconium; it is found principally near Miask, at the foot of the Ural Mountains. M. Caron economizes the zircon by mounting a point of it on a small stick of magnesia or fire-clay, the zircon being made to adhere by compression and afterwards baking.—*Journal of Society of Arts.*

Milk.—The milk supply of this city comes chiefly over the Erie and Harlem Railroads. The Erie, however, brings the largest quantity. The milk train on this road runs out as far as Portersville, a distance of seventy-six miles from the city, and gathers up on each trip at the various stations about 3,800 ten gallon cans, the transportation of which yields a revenue to the road of nearly $2,000 per day, and is probably the most profitable of all the fifty odd trains which daily pass over the eastern division of the Erie.

The milk train arrives at Jersey City a little past midnight, and from that hour until morning a string of milk carts are engaged in carting the milk away for distribution to the families in the city. The conductor assured us that the milk was delivered to the train perfectly pure, and if reduced at all by water it must be done by the milkmen after its delivery to them. Thus, while the denizens of the city are snoring in bed, the agencies employed in supplying their wants are going on with ceaseless energy, reaching to the furthest bounds of the continent.

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Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most prominent home and foreign patents.

GAS GENERATOR.—Dr. W. E. Darrah, Baltimore, Md.—The object of this invention is to construct a simple and cheap burner which can be applied to any hydrocarbon lamp, and by the use of which a clearer, whiter, and steadier light can be obtained than from any heretofore brought into public use.

APPARATUS FOR DRYING BRICKS.—Wm. O. Leslie, Philadelphia, Pa.—In invention the bricks are dried, preparatory to placing them in the kiln, by being carried on a car into a drying chamber, and subjected to a dry air heated to about 90° Fah., thence passing to a second chamber in which the temperature is about 100°, thence passing to a third, where the temperature is 110°, whence they are taken to the kiln. The construction and arrangement of the drying chambers and heating apparatus are designed to regulate the the temperature of the chambers and facilitate the drying of bricks.

SELF RAKE AND REEL FOR HARVESTERS.—F. Schurger and N. Allstatter, Hamilton, O.—This invention has for its object to improve the construction of harvester rakes and reels, so that they may be more satisfactory and effective in operation.

DOUBLETREES, ETC.—Horace Palmer and A. N. Case, Kingsville, O.—This invention has for its object to furnish a simple attachment for doubletrees, whiffletrees, neck yokes, etc., where the power is applied to the ends of a wooden bar, and the resistance is sustained at its centre, so as to greatly strengthen said bar without materially increasing its weight.

AIR AND GAS CARBONIZER.—M. P. Coons, Brooklyn, N. Y.—The nature of my invention relates to improvements in an apparatus for carbonizing atmospheric air or coal gas for illuminating, heating, and other purposes, by the use of petroleum oil, either in a crude state or in a refined state, in its several grades.

SPIRIT METER.—Joel D. Weaver, Troy, N. Y.—The nature of this invention relates to improvements in that class of meters for measuring fluids which consist of a piston working within a cylinder. It consists of an improved arrangement of mechanism for operating the valve.

PARTNERS AND STEPS FOR MASTS OF VESSELS.—D. S. Stevens and Lambert Snedecor, Red Bank, N. J.—The nature of this invention relates to improvement in means for supporting masts in vessels, the object of which is to provide yielding elastic supports for the same, whereby the strain upon them caused by the irregularly-blowing gusts of wind will to a considerable extent be relieved.

SHUTTLE-BOX MOTION.—Michael Rice, Upland, Pa.—This invention consists in suspending the shuttle boxes on the outer ends of levers pivoted to the lay, from the inner ends of which are suspended balancing weights, and providing a vibrating wedge-shaped lever which is operated by a tappet wheel deriving motion from a pawl actuated by the driving shaft, which vibrating lever ultimately raises and lowers the outer end of the said shuttle-box levers.

COMBINED BELT KNIFE, AND MALLET FOR PUNCHING BELTS.—Henry Blake, East Pepperell, Mass.—This invention consists of a knife punch, the blade of which is formed in a shape particularly adapted to form the elongated perforations necessary for inserting the belt fastenings heretofore patented.

STAMP MILL.—Edmund Castle, Lincolnton, N. C.—This invention consists, first, in providing recesses in the lower edges of the dies, and corresponding grooves in the bed plate opening into the recesses of the same in which the dies set, whereby a bent bar may be readily inserted to remove the dies from their beds; second, in the manner of joining together the different parts of the housing frame, and in the arrangement of a swinging gate and adjustable table to govern the delivery of the pulverized ore from the mill.

BALE TIE.—J. A. Shone, Holly Springs, Miss.—This invention relates to a new and improved method of tieing or fastening the bands on bales of cotton or the bands on other baled articles.

STENCIL PLATE.—Eugene L. Tarbox, Nashville, Tenn.—This invention relates to plates through which letters or figures are cut for marking boxes, bales, and other articles called "stencil plates."

CHUCK.—J. S. Detrick, San Francisco, Cal.—This invention has for its object to provide a chuck for use on lathes in machine shops, and for other purposes, which shall enable the operator to move the center of his work without removing the chuck from the lathe.

METALLIC BALE TAG.—Norman C. Jones, Maltby House, New York city.—This invention relates to a new and improved method of marking and insuring the identification of cotton bales as well as bales of hemp, manufactured goods, and other commodities or goods which are usually confined by ropes, hoops, or ties of any kind.

FURNITURE CASTER.—Hezekiah Munroe, Fall River, Mass.—This invention relates to an improvement in casters for furniture, baggage trucks, and other purposes, and it consists in combining a friction roll with the caster spindle.

ICE ELEVATOR.—W. T. B. Read, Chicago, Ill.—This invention relates to a new and improved method of constructing machines for elevating ice in the process of filling in houses and handling blocks of ice in other situations where it is necessary to elevate the same.

FOLDING STOVE AND BAKER.—D. C. McNeill, De Witt, Iowa.—This invention relates to a new and improved method of constructing stoves whereby they are rendered more portable and easier of transportation, the stove being especially intended for camp use for soldiers, trappers, and emigrants.

SECRETARY.—Ezra Ale, Clearfield, Penn.—This invention consists in providing within a case a series of small cases of drawers or pigeon holes, suspended from rods which are connected at both ends to endless belts arranged upon pulleys at the top and bottom of the large case. The pulleys being actuated by a crank on the shaft of the lower set which projects through the wall of the case whereby the said interior cases may be moved away from or up to an opening provided in the outer case.

HAND CULTIVATOR.—Barnett Taylor, Forestville, Minn.—This invention has for its object to furnish an improved hand cultivator for cutting the weeds and stirring the ground between plants, whether of vegetables, grain, or trees, planted in rows or drills.

SIEVE.—Mrs. J. D. Jones, Jersey City, N. J.—This invention has for its object to furnish an improved sieve, designed to take the place of the cullenders, sieves, and coarse cloths that are now used for screening and straining pumpkins, apples, etc., and materials for catsups, jellies, etc., which shall be simple in construction and effective and convenient in use.

MACHINE FOR TINNERS' USE.—Walter Forshee and Jesse L. Judd, Marathon, N. Y.—This invention has for its object to furnish an improved machine for tinners' use, designed especially for cutting out flaring work, such, for instance, as the sides of pans, pails basins, etc., with dies, which shall be simple in construction, easily operated, effective in operation and readily adjusted to cut out work of different sizes.

TINSMITHS' STAKES.—A. W. Whitney, Woodstock, Vt.—This invention has for its object to simplify and improve the construction of tinsmiths' stakes, so as to make them more convenient and less expensive, only one standard being required for a great variety of stakes.

WATER WHEEL.—O. M. Pike, North Leverett, Mass.—This invention relates to a new and improved horizontal water wheel, and it consists in combining with the wheel a slotted cylinder or drum, constructed and arranged in such a manner that the cylinder is made to serve as a stop to the water and effectually pevent any water from passing through the wheel case except that which acts upon the buckets of the same.

DRAM FLASK.—Wm. T. Fry, New York city.—This invention relates to a new and useful improvement in dram flasks and has for its object the substitution of some cheaper cheaper material than leather, but equally as durable, to the exterior of the glass bottle.

DEVICE FOR PICKING FRUIT.—N. G. Hughes, Waynesburgh, Pa.—This invention relates to a new and improved device for picking fruit, and it consists in a novel construction of the implement, whereby fruit may be picked from a tree with the greatest facility.

CONSTRUCTING CASES OR SHELLS FOR ROTARY BLOWERS.—P. H. Roots and F. M. Roots, Connersville, Ind.—The object of this invention is, first, to avoid the necessity of boring out the interior concave surface of the shell or case; and secondly, to obviate the necessity of facing or planing the end or head plates of the case, both of which have always heretofore been done in cases of this kind, which requires the case to be cast in separate parts, while by this method the case is cast in one entire piece.

CHURN.—J. Stadler, Detroit, and G. M. Streng, Plymouth, Mich.—This invention relates to a new and improved method of constructing butter churns, whereby butter is more quickly and economically made, and consists of a churn having on the inside a rotating dasher, and provided also on the inside with shifting wings, moved by levers on the outside of the churn, whereby greater or less resistance is offered to whirling the contents of the churn.

STEAM INDICATOR.—F. T. Riegel, Philadelphia, Pa.—This invention relates to a device for indicating the pressure in steam boilers, and it consists in arranging a steam chamber in communication with the boiler, and providing the same with a yoke which is held to its seat by a yoke and weight.

VALVE FOR WATER CLOSET.—W. Smith, San Francisco, Cal.—This invention relates to a new and improved construction for valves for water closets, and more particularly designed for the kind known as the Hopper water closets.

GATE.—Munson F. Kent, West Union, Iowa.—This invention relates to a new and improved method of constructing gates, whereby the same are more easily opened and shut, and whereby the same are less liable to obstruction from heavy snow.

PISTON PACKING.—William Wilson, Galesburg, Ill.—This invention relates to a new and improved metallic packing for pistons, and it consists of a peculiar construction and arrangement of rings and points, whereby the packing is allowed to accommodate itself to a cylinder cut perfectly true or round, and requires less steam than usual to adjust it or set it out, and is also allowed to travel over counter bores with facility.

POWER CRANE.—W. T. Durfee, New Bedford, Mass.—This invention relates to a new and improved crane, designed more especially to be operated by steam or horse power, and for raising and lowering heavy bodies. The object of the invention is to obtain a crane of the kind specified, which may be operated or manipulated with the greatest facility, be simple in construction, not liable to get out of repair, and which may be constructed at a moderate cost.

LOOM.—John J. Switzer, Roxbury, Mass.—This invention relates to a new attachment to looms, which has for its object to instantly cause the stopping of the machinery as soon as one of the warp threads breaks. As threads frequently break during the weaving process; and as by their breaking much annoyance is caused to the weaver, and injury to the fabric, this invention will be of great benefit to all manufacturers of woolen and cotton goods, more so as it is easily applicable to all looms of suitable construction. When a thread breaks, on fine goods, it is not always discovered at once, and if the weaving is continued, the whole fabric is spoiled. This invention is a thread protector, so arranged and applied to any ordinary or suitable loom, that at any moment a thread breaks, the loom will instantly stop, and cannot proceed until the severed thread has been repaired by the attendant.

TIN CAN.—G. E. Hegerman, Brooklyn, N. Y.—This invention relates to a new tin can, which is to be more particularly used for the keeping and transportation of petroleum and other liquids. The invention principally consists in providing a cap for such can, which is to be closed by means of a screw plug, that can be removed when the contents are to be discharged. By means of this plug, the can may be opened and closed at pleasure; while the ordinary caps now in use are mostly such that they must be destroyed to open the can.

PLATFORM SCALE.—John Decker, Sparta, N. J.—This invention relates to a new platform scale, which is combined with a spring balance in such a manner that the weight of an article placed on the platform will be indicated on the spring balance. The invention consists in the use of a yoke shaped lever, which rests with its two ends upon stationary supporrs, while its middle is suspended from the hook of spring rod of a spring balance.

TAILOR'S SEAT.—Frederich Neuhaus, Belleville, Ill.—This invention consists in providing the hinged back support of a tailors' seat, with an adjustable elastic gage, by which its degree of inclination can be regulated. This gage consists of a screw and spring so applied that the aforesaid result will be obtained. The invention consists also in so constructing the leg support with the bar that holds it, that the said leg support may be elastic and also up and down adjustable. The invention finally consists in bending the bar, that slides on the seat, and that supports the legs supports, so as to bring the leg support opposite the middle of the seat.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

G. W. C.—If your friends are correct who think that a fly wheel can create force, it ought to do some work independently of any steam cylinder, and the "perpetual motion" is not a chimera, but a possibility within the reach of their inventive skill. The heavier the fly wheel the more force it will absorb when started, and give off when required; but the idea that force can be created by mechanical means, is opposed to theory, practice, and common sense.

M. W. D., of N. H.—To prevent condensation in a steam pipe laid under ground, a good plan is to place it inside another larger pipe, filling the intervening space with pulverized charcoal. The outside pipe should have its joints made water tight. We have seen this tried, and know it to be good.

E. L. G., of N. Y.—The particular information you want about crystals of alum, we cannot supply.

J. G. K., of N. Y.—Your article on Encke's comet is so purely speculative that we cannot find room for it in our paper.

J. H. H., of N. Y.—We do not believe in the "momentum" of steam as generated; the production of steam is a gradual process.

S. C. T., of Colorado.—How can I separate gold from cast iron when alloyed. Disolve in "*aqua regia*" having a slight excess of hydrochloric acid. Add solution of protosulphate of iron and the gold will be precipitated in a metallic state.

W. P. J., of Pa.—Castile soap is colored with persulphate of iron, commonly known as green vitriol. To describe to you in full the process of manufacture, would take too much of our time and space. Otto on soaps published by D. Van Nostrand, 192 Broadway, New York city, is the book you need.

L. S. C., of Ill.—On page 177, Vol. XVII., of the SCIENTIFIC AMERICAN, you will find a drawing of the device used on Grover and Bakers Sewing Machine, with full description. By examining that description you will see a difference in mechanism from the device which you defend, which it will pay you to study. "First be sure you are right then go ahead."

H. C. S., of Chicago.—In running on a belt from a shaft 4 inches in diameter to a pulley 20 inches in diameter, the shaft making 360 revolutions per minute there should be no shock to the machinery. The best and quickest method of stopping cars, hitherto discovered is to apply the brakes directly to the wheels.

Business and Personal.

The charge for insertion under this head is one dollar a line.

N. C. Stiles' pat. punching and drop presses, Middletown, Ct.

Siccohast is a hasty drier for linseed oil, a new discovery by Mr. Asahel Wheeler, of Boston, Mass., which is deserving of the attention of all persons interested in paints. It has received the most critical examination by the United States officials of the Navy Department, and is recommended and adopted by them for general use.

The campaign novelty is a rich thing. Agents guaranteed $20 per day. Sample 75c. Circulars free. Address J. H. Martin, Hartford, N. Y.

A.P.S., of Me.—Please send address to C. Howard, box 5078, postoffice, Boston.

Manufacturers of tub and pail machinery please send catalogue and price list to Redington, Nelson & Co., Whitewater, Wis.

Send circular of the best gas carbureter, without water or heat, to 505 Minor st., Philadelphia, Pa.

Wanted—the best wood knolling machine made. Also, good second-hand sash and blind machinery. Lingle & Son, Rock Island, Ill.

New Brick machine, patented 1868. Bricks dried without floors—spread on the grass or hillside; easily secured from rain; no washed bricks. For pamphlet, address, sending 25c., F. H. Smith, box 556, Baltimore.

The patent sweet fern and chemical lacing, as made by J. H. & N. A. Wilhams, Utica, N. Y., is far superior in quality and strength to any other belt lacing in market.

For sale—just finished—an 18x42 Wright engine. Address Merrick & Sons, Philadelphia, Pa.

For sale—the whole or a part of a paper mill, all new machinery. For particulars address L. A. Beardsley, Fredericksburg, Va.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

Machine shop and foundery to let, well established. First-class tools and patterns, now running on cotton, woolen, and general machinery. Work for seventy-five hands. Ill health sole reason for letting. A rare chance. Address H. H. Morse, Attorney-at-law, Rhinebeck, N.Y.

For sale—the patent right, in Great Britain, for perforated saws. The manufacture of these saws is now firmly established in the United States, and they are rapidly taking the place of all solid saws. Apply to J. E. Emerson, Trenton, N. J.

Send for description of Huntoon governor on entirely new principles. 103 State st., Boston, or 79 Liberty st., New York.

For descriptive circular of the best grate bar in use, address Hutchinson & Laurence, No. 8 Dey st., New York.

Millstone-dressing diamond machine, simple, effective, and durable. Also, Glazier's diamonds, diamond drills, tools for mining, and other purposes. Send stamp for circular. J. Dickinson, 64 Nassau st., N.Y.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

B.—You will have no trouble with grease and dirt, and save much oil by using Broughton's lubricator and oil cups. Shaw & Kennedy, Buffalo, have them.

Westerman Iron Co., Sharon, Pa., wish to obtain a machine for testing hoop iron.

Match it. Four-Horse Portable Engines, complete, with Governor, Pump, etc., $550. Other sizes in proportion. Hampson & Copeland,—warerooms, 89 Liberty st., N. Y.

EXTENSION NOTICES.

U. S. PATENT OFFICE,
WASHINGTON, D. C., July 22, 1868.

William Porter, of Williamsburg, N. Y., having petitioned for an extension of the patent granted to him on the 24th day of October, 1854, for an improvement in "Securing Lamps to Lanterns," it is ordered that said petition be heard at this office on the 19th day of October next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., July 29, 1868.

Clara B. Snow, of Independence, Iowa, executrix of the estate of Harvey Snow, deceased, having petitioned for an extension of the patent granted to the said Harvey Snow the 21st day of November, 1854, for an improvement in "Presser-bar for Planing Machines," it is ordered that said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., August 3, 1868.

Chesley Jarnagin, of Bean's Station, Tenn., having petitioned for an extension of the patent granted him on the 31st day of October, 1854, for an improvement in "Seats for Wagons," it is ordered that said petition be heard at this office on the 19th day of October next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 5, 1868.

George Miller, of Providence, R. I., having petitioned for an extension of the patent granted to him on the 7th day of November, 1854, for an improvement in "Leather Banding for Machinery," it is ordered that said petition be heard at this office on the 26th day of October next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 11, 1868.

George Crompton, of Worcester, Mass., having petitioned for an extension of the patent granted to him on the 14th day of November, 1854, for an improvement in "Looms for Weaving Figured Fabrics," it is ordered that said petition be heard at this office on the 26th day of October next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

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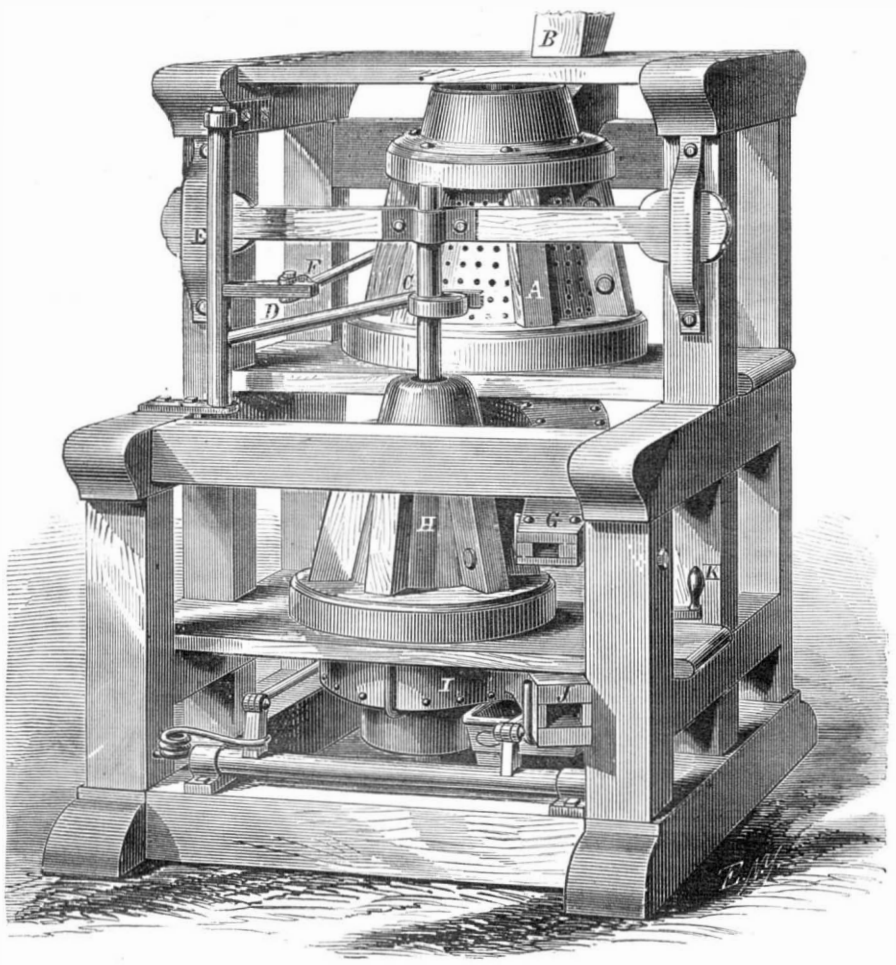
Improvement in Device for Cleaning Grain.

The design of the machine shown in the engraving is to properly cleanse the grain from smut, straw, etc., before it reaches the grinding hopper, and it consists of a series of cones and fans combined. The grain is fed into the upper cone, A, by the spout, B, which first delivers it to a vibrating screen—not plainly seen in the engraving—but which is driven by means of upright shaft and cam or tappet, C, bar, D, rock-shaft, E, and bar and connection, F. The outer shell of the cone, A, is of perforated sheet metal containing a corresponding sheet metal core mounted on an upright shaft, to which a high velocity is imparted. From this cone the grain passes to a fan blower directly under it, which separates the particles of smut and other foul matter from the grain and blows it out through the spout, G, conveying the grain by another spout to the scouring cone, H, having brushes fixed on its interior surface and containing a rapidly rotating cone, also furnished with brushes; the two sets arranged at such an angle, compared one with another, that they pass each other as the blades of shears. From this cone the grain goes to the blower, I, which drives off the remaining refuse through the spout, J. The grain in the blower, I, is delivered to another vibrating screen, worked in a manner similar to the upper one, and which may be made of such a grade of meshes, if desired, as to separate the kernels according to size. The lower ends of the upright shafts, which drive the inner cones by means of belts and pulleys, rest on suspended cross bars that may be raised to adjust the cores of the cones to the size and character of the grain to be operated upon, by means of screws, the handle of one being seen at K.

This improvement was patented June 23, 1868, by Carl Millar, Sandoval, Ill., who will reply to all communications relating thereto.



MILLAR'S PATENT SMUT MACHINE AND GRAIN CLEANER.

Parton on Alcoholic Drinks.

We do not deem it necessary to offer any apology for the republication, from the *Atlantic Monthly*, of the able article from the pen of James Parton, on the use of alcoholic liquors, entitled "Will the Coming Man Drink Wine?" We consider this article to be so complete a review of the whole subject, both from a scientific and social point of view, and such a masterly plea against the use of alcohol in any form, that it is the duty of the press, without regard to its particular adaptation to the special features of individual publications, to give it as wide a circulation as possible, and thus aid in ridding the world of its greatest curse.

We shall publish the article in two installments, the first of which we give in this number, and we cannot too strongly urge the thousands of young mechanics who weekly peruse our columns, to consider well the points so ably established in this excellent essay; and use their influence and example in helping to uproot the evil of strong drink, which is the fruitful source of more misery and crime than any other cause on earth.

OBITUARY.

DEATH OF A WEALTHY INVENTOR.

Edwin A. Stevens, died in Paris on the 7th inst., of rheumatism. Although for ten years he had suffered more or less from this complaint, his death at this time was unexpected. His father was a co-laborer with Fulton in the introduction of steam navigation, and Mr. Stevens early devoted himself to the study and improvement of marine machinery. The propeller screw was invented by his brother Robert L. Stevens, and his own experiments upon the double screw were crowned with considerable success. The Stevens Battery, to which the modern system of iron plating undoubtedly owes much of its origin, was built by these brothers. The estate known as the Hoboken property, was inherited by him, and by its judicious improvement he amassed an immense fortune, his estate being estimated at $20,000,000. He was very highly esteemed by all who knew him, and by his death New Jersey loses one of her most influential and worthy citizens.

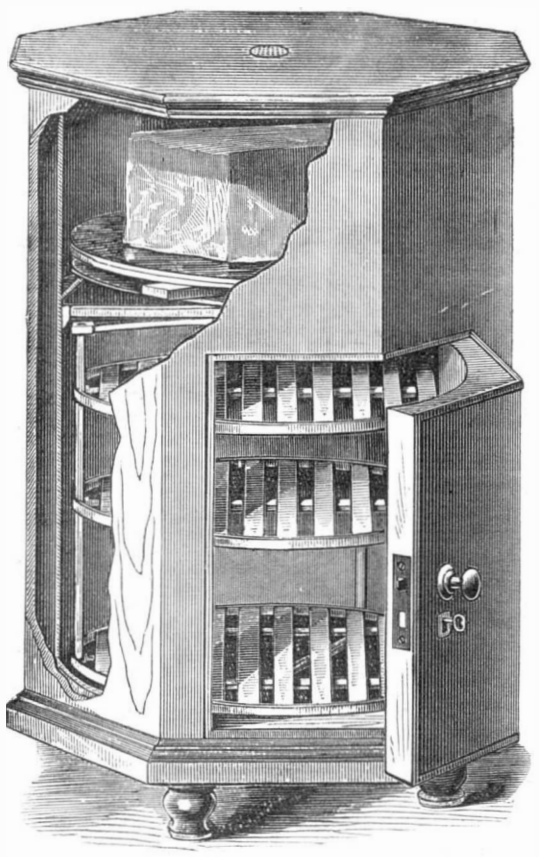
FACTS AND CONJECTURES.

In looking over our exchanges, we notice a request from a correspondent to an agricultural paper for information as to how much lime or impurities, in running streams, would render the culture of trout unsuccessful. And he adds, "facts are what we want, not hypotheses." Ah, thought we, how much labor would have been spared the world if that had been made the rule in the past; if, instead of sitting down to frame conjectures as to what things might be, men had set themselves to work to ascertain what they really were. Most of our readers are familiar with the story of the dispute over the question why a bucket filled with water would not overflow when a fish was placed in it. The philosophers framed all sorts of conflicting hypotheses, and grew hot in the defence of their favorite theories, until it was wisely suggested that it would be as well to ascertain what was the fact in the case. When tested, it was found that when the fish was put into the bucket, the overflow took place, and the would-be philosophers were put to shame by a simple fact. Whether this story is a fable, or otherwise, it is a type of many disputes which have seriously engaged the minds of men, whose efforts, rightly directed, might have been of great value. It is only a very few years since a learned professor in an American college set himself to show that all the facts of the universe, and its phenomena could be determined, *a priori*, and put forth to the world a system of cosmology fully as absurd as the conjectures of the above-mentioned philosophers in regard to the fish. An eloquent reviewer of this most absurd attempt to conjecture causes that would account for universal facts, writes as follows:

"Who that believes in such a philosophy would trouble himself to spend wearisome days and nights in studying the pages of Newton and Laplace? who would scale mountains and penetrate into the frozen regions of the poles in search of knowledge? who would torture Nature in crucibles, drown her in acids, consume her in flames, stretch her upon racks, crush her under weights, in order to wring from her the secrets of her being, when he believes that all he can thus learn can be deduced from pure reason?"

The age for conjecture is past. "Facts are what is wanted," and hypothesis is worthless except as it leads the way to the discovery of realities. Less abstract speculation, less thought upon the imaginary, and more work, more attention to the real, the tangible, and the practical, is the tendency of the time.

SWEETLAND'S PATENT ROTARY SHELF REFRIGERATOR.



The principle of the preservation of ice in refrigerators, that of prevention of rapid evaporation by inclosing it within non-conducting walls, is generally understood, and refrigerators of even the cheapest sort are built in accordance with it. Ventilation is also frequently secured, at least in a measure. The refrigerator herewith illustrated is not claimed to be markedly superior to every other in these respects. Its main peculiarity and advantages are convenience in construction, compactness of form, and handiness in use. The latter quality is quite noticeable, as the shelves rotate so that the dishes of food can be readily placed in the receptacle, and when required to be removed present themselves successively at the door, obviating the necessity of soiling the dress in reaching over one dish for another.

The engraving exhibits the refrigerator in perspective with the door opened and a portion of the side broken away to show the interior. The outside, which is of an octangular form, is of wood, as usual, and the inside of zinc, the space between being left either empty or filled with a non-conducting material as desired. The inside is of circular form in its cross section, and under the ice receptacle in the upper part has a series of slatted shelves supported on central pivots at top and bottom on which they turn. The ice is placed on a disk covered with zinc, the edges of which do not touch the inner surface of the refrigerator, but the disk is supported by lugs secured to the walls. The ice disk is double, and just below its lower edge is a gutter around the interior of the cylinder, to receive the drippings from the ice, which are conveyed through the bottom of the refrigerator to any convenient receiver by one or more pipes passing down by the inner wall. The cover is double and has perforated ventilators in each section which convey away the gases arising from the food. The slats of the shelves may be removed for cleaning. This unique contrivance is the subject of two patents obtained through the Scientific American Patent Agency, bearing dates, August 27, 1867, and July 7, 1868. Orders and applications for further information may be sent to the patentee, Anthony B. Sweetland, Fitchburg, Mass., assignor to himself and James Daley of the same place.

Are Locusts Poisonous?

We find a number of items in the newspapers this year claiming that locusts, their bite, sting, or eggs, are poisonous. In Georgia it is stated that a young lady lost her life by rubbing her teeth with a twig (of *cornus Florida*, probably, as that is frequently done) in which a locust had deposited its eggs. And somewhere in the West, fishes are said to have been poisoned by berries in which locusts had deposited their eggs, and which had fallen into a stream. And the following items we find in the papers:

"Locust eggs appear to be very deadly in their poisonous effects. A party of little boys was recently killed by eating mulberries in which they had been deposited, and so rapid was the work of the poison that they died under the trees from which they took the berries.

The death of a little girl at Kimmswick, Mo., resulting from the sting of a locust, is noted by the local papers."

Now, "e'en from our boyish days," in the south and southwest, we were familiar with all kinds of locusts, handled and played with them constantly, and knew other children to do the same, and the worst thing we ever knew or heard about them was their intolerable music. This idea of their being poisonous is a new one to us—but, then, this is Presidential year, and it may be that the locusts have become inoculated with the "poison of politics," hence the trouble!

If, however, the locust is really poisonous, it should be known, and our readers will confer a favor by reporting their observations on the subject.—*Medical and Surgical Reporter.*

The Union Pacific Railroad.

We draw attention to the article from S. D. P., in this issue, relative to this great international work. Being well acquainted with the writer, knowing his superior means of information, and having the utmost confidence in his honesty of purpose, and facilities for obtaining facts, with a talent for presenting them as they really are, we commend his article to our readers as a fair statment of facts which may have been more or less distorted to serve the purposes of stock gamblers.

Judge B. F. James, of Illinois, recently appointed Examiner-in-Chief of the Patent Office, has received his commission and entered upon the discharge of his duties. Judge James, for the past seven years has been Principal Examiner in the class of civil and railroad engineering, and his long experience qualifies him for the position to which he has been appointed. The notice of this appointment was accidentally left out of our last week's issue.

In boring an Artesian well at Chicago, a vein of water was found at the depth of 1,200 feet. The direction of the flow was ascertained by lowering into the bore, by means of a fine wire, a long lead plummer. The weight would descend steadily until it reached the stream, when it would be suddenly jerked in the direction of the flow.

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VOL. XIX., No. 9....[NEW SERIES.].... *Twenty-third Year.*

NEW YORK, WEDNESDAY, AUGUST 26, 1868.

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SOME THINGS A MECHANIC SHOULD KNOW.

Subdivision of labor insures skilled work, but the confinement of the mechanic's knowledge to one single manipulation detracts from his usefulness. This apparent paradox is easily explainable. Take the pattern maker as an example. The department that prepares his work is that of the draftsman; that which perfects or ultimates it is that of the molder. Now, although it may be true that the "Jack at all trades is good at none," yet he who understands, at least in a measure, the design or intention of the workman who is his predecessor in the chain of industry, and the duties and needs of him who follows his work, is more capable than the workman who can only mechanically use the tools of his craft. He will not only do his work intelligently, making a perfect job, but will be able to ascertain imperfections and detect omissions in the work of those who preceeded him, and suggest, at least, by his own work, the proper method for those who succeed him.

Confining ourselves to the pattern maker, let us see the difference between the workman who knows merely how to get out his stock, prepare the pieces, and put them together in a workmanlike manner, and the workman who conceives and understands the design of the draftsman as imaged on the sheet before him, whether shown in perspective, plan, or section, and knows something of the manipulations of the molder's art. In the one case, the workman must be overlooked, instructed, and guided in every move, by some one who has an educated intellect and understands the object of the work in hand. In the other case, the intelligent pattern maker goes coolly, steadily, and quietly to work, correcting defects, and possibly suggesting improvements. His work is always perfect, and he can be always be depended upon in emergencies. Give him a drawing and he knows the object and intention of the draftsman, perhaps taking time to ascertain them; but when he does understand, he needs no oversight, and when his work is finished it is correct.

There are comparatively few machinists who can work from a drawing. In one shop, with which we were formerly practically acquainted, the workmen at the forge and at the lathe were furnished with a model or pattern of their work, as much as the molders in the foundery. If these workmen had informed themselves, never so slightly, of the principles and practice of mechanical drafting they could have wrought intelligently from drawings. Yet the theoretical and practical knowledge so useful is seldom possessed, when it may be obtained by the devotion of a few hours of attention in the leisure every mechanic has.

Beside this partial knowledge of cognate branches of his business, which every mechanic could and should possess, some knowledge of a technical character, easily obtainable from ordinary school text-books, should also be added. A decent smattering of chemical nomenclature; a knowledge, however limited, of chemical combinations; some ideas of natural philosophy as applied to mechanics; a good acquaintance with arithmetic, including algebra, and a familiarity with the principles of geometry, the science of sciences and the foundation of all that is useful in the arts, should be possessed by the mechanic.

All these may be easily obtained. The way is open, the road easy, and the goal within the reach of all. Success attends endeavor, and success is possible to all. Skilled labor guided by educated brain—discretion, good judgment, common sense, and intelligence—is always a marketable commodity, bringing its full value to its fortunate owner, who may reasonably consider himself the possessor of present independence and prospective competence, and as such the peer of the most favored in the land.

PROGRESS OF SUBMARINE TELEGRAPHY.

Very few not directly interested in marine telegraphy are aware of the immense progress in this art, or of the solid basis upon which success is predicated, not only of the cables already laid, but of others which are projected. No less than eleven cables are laid between the several islands of the British group connecting that country with Holland, Belgium, Denmark, and the different islands with each other. To these must be added the two cables between Ireland and America, which, in conjunction with the cables connecting Ireland to England and the continent, unite the two hemispheres.

The Islands of Zealand and Funen have been connected to the continent by Denmark. In the Mediterranean Sea there are several cables laid, and working perfectly. France is joined to England by three cables; Asia is in communication with Europe through two cables, while America has united all her possessions in the Atlantic and Pacific by these slender yet powerful bands. In the Indian Seas two cables are working, having stood the test of several years' service.

In the Mediterranean a cable is about to be laid connecting Nice *via* Corsica with Algeria; while appearances indicate that a new cable will shortly be laid between France and America. This cable will be laid in two sections; the first from Brest to St. Pierre, Miquelon, a distance of 2,688 miles, and from thence to New York, a distance of 950 miles. The time fixed for the completion of this great work is August 15, 1869. An English exchange in speaking of this cable says:

"The grounds upon which the projectors have found favor with the French and New York State Governments have been, chiefly, that the proposed cable will obviate the circuity and delay incident to the present line; and will also lessen the existing liability to casualties. By the only route we now have not less than four submarine cables have to be employed, while the electric fluid has to perform four land journeys also before a message can be sent from the Continent of Europe to New York. There intervene—1, the North Sea, or the English Channel; 2, the Irish Sea; 3, the Atlantic; 4, the sea between Newfoundland and the American continent; while the wires have also to be carried across England, Ireland, Newfoundland, and, lastly, from the coast of British America southwards to New York. It is, perhaps, surprising that with this circuity, messages are sent from Europe to the United States as quickly as they are; but there is no doubt that communication will be very much accelerated if, as is said, a merchant or banker at Paris will be able literally to speak into New York. It may possibly be a sanguine calculation that messages between those cities may then be sent and answered in half an hour, and that messages may be sent from Berlin or Frankfort to New York and answered within an hour; but the difference of time must obviously be very great. It is thought also that the directness and simplicity of this route will very much diminish the chances of communication with America being from time to time put out of gear. Ocean telegraphy has now been carried to such perfection that there is more fear of mishap by land than by sea; and, in point of fact, during the last two winters, when we have several times been alarmed by a stoppage of messages, the explanation has in each case been that storms had blown down the land telegraphs, sometimes in Newfoundland, sometimes on the American mainland. From this danger, whatever it may amount to, the new line will be exempt. As the capital it will represent will, it is stated, be only £1,000,000, and as the working expenses, with only two stations (at Brest and at New York), ought to be very small, it is probable that this project will bring the luxury of telegraphing across the Atlantic within the reach of persons of very moderate means. A cable laid across the English Channel, from Falmouth to Brest, would also give us the benefit of it. It is understood that the new Atlantic cable will be ready for laying next June."

Improvements are being made, not only in the cables and apparatus used for telegraphy, but in the mode of transmitting messages. A newly invented system of telegraphing by code is announced in England. Numbers are used instead of letters, each number indicating a word or a phrase, the translation of the message into the numbers, and *vice versa* being done by clerks. A large saving of time and greater accuracy is claimed for this invention.

Nothing illustrates the general progress of the age so much as the rapidity with which the art of marine telegraphy has spread its lines through the deeps, thus annihilating distance and uniting the nations of the earth into a closer brotherhood.

MINING AND TUNNELING BY MACHINERY.

During the protracted siege of Sebastopol, Capt. Penrice, of the Royal Engineers, devised a very ingenious machine for tunneling, but the siege was cut short before the merits of the invention could be thoroughly tested. Enough, however, was done to satisfy the inventor that he had contrived a really valuable thing, and since that time, in the face of much doubt and opposition, he has pushed forward the invention to a point where it promises success.

In April last Capt. Penrice called upon us in Paris, and, by the aid of drawings, fully explained his invention, at the same time he invited us to examine a working machine under construction at one of the large machine shops near the city.

The machine resembles a horizontal steam hammer, so modified that the head can rotate as well as strike. The piston is cast in gun-metal in a single piece with the head; the diameter in the 5-foot machine is 28 inches, and the stroke, which varies according to the nature of the rock being operated upon, averages 2 inches, and can increase to 4 inches. The diameter of the head is 5 feet, and this diameter corresponds with the diameter of the level to be driven. The head is a disk, with so much removed as shall leave a Maltese cross, occupying about two-thirds of the area, the remaining third, being open, serves for the passage of the debris to the back of the machine. The entire field of these segments is covered with cutters, in the form of double chisels, and arranged concentrically from the center to the circumference. The piston moves in a cylinder of cast iron, with a flat bottom, and is furnished with a stuffing box in front, the steam being admitted from a secondary regulating cylinder. As to the rotation of the head, there is a transverse horizontal shaft, which, by means of two intermediary shafts, gives a slow motion to another shaft, inclined upon the piston perpendicular to its axis by a screw pinion gearing, with a helicoidal wheel fixed upon the piston by a couple of keys. The debris is drawn to the back of the machine, so soon as broken down, by a series of hoes attached to an endless chain, worked by wheels and pinions, and ample arrangements have been made for providing sufficient space on one side of the machine to enable the face to be reached when the renewal of the chisels or other circumstances require it.

A company has been organized to work the invention, and it is stated in the London *Mining Journal* that they are prepared to guarantee an average progress of twelve feet in granite, and eighteen feet in sandstone rock in 24 hours' work. With regard to the continuity of the working, the sole interruption will be that resulting from the removal of the blunted chisels and the fixing of fresh ones. The changing of the chisels will not, according to Capt. Penrice, occupy more than two hours. All that is neeessary is to draw back the machine a few feet, so as to allow a couple of workmen to pass in front of the head through the openings to remove the worn chisels and replace them with new ones, two other workmen behind the head unscrewing and re-tightening the nuts.

A Commission appointed by the French Government have quite recently made a full examination of a six-foot machine now in operation in a quarry at Vaugirard, Paris, and have also seen it in operation there; and, although their official report has not yet been presented, the Commissioners have individually expressed their entire belief in the general utility and extraordinary capabilities contained in the invention. The machine has been at work nearly every day for the last seven or eight weeks, and up to the present time but one set of chisels has been used, and these have not even once been sharpened.

It is worthy of remark, in this connection, that the Emperor Napoleon, with an enlightened regard for the material prosperity of France, took a warm personal interest in this invention, as he has done in many other instances; an example worthy to be imitated by other rulers.

THE AMERICAN SCIENCE ASSOCIATION.

THIS distinguished body has again held its annual session, and performed its usual amount of service to the world at large by the elaborate discussion of such subjects as the "Nature of Thought," "The Statics of the Four Types of Modern Chemistry, with Special Regard to the Water Type $\frac{H}{H}\}O$," "The Chemico-Geological Relations of the Metals," "The Stratigraphical Relations of the Fossil Horse in the United States," etc. No doubt the savants have a pleasant time in cracking these hard nuts. Their meats are, however, too indigestible for the mental stomachs of the generality of readers.

It is but just to add, however, that some time has been devoted to more practical subjects, among which we notice "The Effect of Atmospheric Changes on the Eruptions of the Great Geyser of Iceland," by P. A. Chadbourne. The eruptions of the Great Geyser are known to take place more frequently in fair weather, and it has long perplexed travelers to find a solution for this singular phenomenon. Mr. Chadbourne stated that the Great Geyser is a tube ten feet in diameter by seventy in depth, surmounted by a saucer-shaped basin seventy feet broad and four feet deep. When an explosion takes place, the water in the basin, and two-thirds of that in the pipe, is projected into the air. The explosion is caused by the gradual heating of the water far above the boiling point. The water which replaces that blown out by the explosion, has a temperature of 212°. An explosion will again occur when the water at the bottom of the tube becomes heated to 266° The reason why the explosions are less frequent in January than in August, is that cold water trickling through crevices mixes with the water at the bottom, and prevents the rapid rise of temperature which takes place at the latter period, when the surface is dry.

Prof. Whitney read a valuable paper upon "The Progress and Present Condition of the Geological Survey of California." He dwelt upon the importance of the work, and stated that a great deal of the coast survey work was a fraud on the Government. He also exhibited some fine maps of different parts of California.

An excellent paper was also read by John L. Hayes on "The Recent Contributions of Science to the Arts of Dyeing and Printing Woolen Tissues," which we can not do more than allude to. These latter papers are of the class demanded by the age and the public, and we trust that in the future proceedings of this and similar associations this fact will be borne in mind. People are getting to care less and less for abstract speculation; they want practical knowledge, and will be content with nothing else in this material age.

GRANITE, notwithstanding its exceeding hardness, splits as straight and clean as a chestnut stick. At one of the granite quarries of Maine recently, a block was split out which measured 100 feet long, 8½ feet wide, and 5 feet thick. It weighed over 300 tuns.

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OFFICIAL REPORT OF PATENTS AND CLAIMS

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On filing each application for a Patent, except for a design	$15
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80,796.—EXTINGUISHER FOR LAMPS.—Chas. E. Abbott, Malden, Mass.

I claim the lid, a, so hinged and supported that when the wick, C, is lowered the lid will fall over it and close the mouth of the wick tube, B, substantially as set forth.

80,797.—WASH BOILER.—Joseph Adams, Cleveland, Ohio.

I claim, 1st, The open frame or rack, F, in combination with the removable base, B, and boiler, all constructed and operating substantially as set forth

2d, The apron, G, and base, B, in combination with the rack or frame, F, substantially as and for the purpose set forth.

80,798.—PROCESS FOR DESULPHURIZING ORE.—John F. Alexander, Shelby, N. C. assignor to himself and Peter S. Michie.

I claim the method herein described of desulphurizing ores, by exposing them to heat in a closed vessel or retort, in contact with charcoal, graphite, or other carbonaceous materials

80,799.—SHUTTER OPERATOR.—James H. Barker (assignor to himself and D. R. B. Nevins), Washington, D. C.

I claim the jointed bar, G, constructed in the form herein set forth, and applied to the window blind and casing substantially as and for the purposes set forth.

80,800.—MILK CAN.—James A. Bennett, Millerton, N. Y.

I claim, 1st, A milk can made with the hollow sheet metal jackets, g h, forming non-conducting air chambers, between which jackets the can is exposed, for the purposes and as set forth.

2d, The removable band, m, in combination with the jackets, g h, for covering the can between said jackets, as specified.

80,801.—JOUCH OR CRADLE.—A. E. Blood, J. B. Blood, and F. W. Pope, Lynn, Mass. Antedated July 29, 1869.

We claim, 1st, In constructing an infant's couch, the combination of the sides, A A, in combination with the bows, B B substantially as and for the purpose set forth

2d, Suspending a couch by elastic or spring hangings, so that it may be capable of vertical reciprocating movements, and also admit of being swung laterally, substantially as described.

3d, Arranging the treadle bar, G, in such relation to the couch that it can be raised to connect with and operate the same, and, when not in use, to drop clear of the couch, and allow it to be swung laterally, substantially as described.

80,802.—RECLINING CHAIR.—Charles Brada, Charlestown, Mass.

I claim, 1st, The seat frame, b, resting loosely on the rear of the main frame, and connected with the foot rest, c, when constructed and operating substantially as set forth.

2d, The combination and arrangement of the pivoted back frame, t g, the sliding seat frame, b, and the foot rest, c, when constructed and operating substantially as and for the purpose set forth.

80,803.—SUPPORTING ATTACHMENT FOR SAILS.—Charles S. Brown, Pittston, Me.

I claim the combination of the adjustable hook, E, and its runner, D, with the yard, A, such being to operate in the manner and for the purpose specified.

80,804.—ELEVATOR FOR SIRUP PANS.—Oramus W. Burnham, Hillsborough, and Henry F. Burnham, Acworth, N. H. Antedated March 9, 1868.

We claim, 1st, The evener, N, rods, h b h h, cross, H, in combination with arm, C, and brace, D. lever, L, and standard, B, arranged substantially as and for the purposes herein set forth.

2d, The pan, G, in combination with the hooks, k k k k, cross, H, substantially as and for the purpose specified.

80,805.—MACHINE FOR SHARPENING HORSESHOE CALKS.—Ensign A. Bushnell, Horicon, Wis. Antedated July 18, 1868

I claim the slotted adjustable gage, R, and loop, D, with the screw bolt and set screw, in combination with the solid spring, B, main stock and burr, E, as herein described, for the purpose specified.

80,806.—HAY SPREADER.—Alex. H. Cayl, Groton, Mass.

I claim the combination of the rock shaft, G, provided with arms, F, hand lever, H, links, E. levers, C, and spreader shaft, B, arranged and operating substantially as and for the purposes set forth.

80,807.—DIE FOR MAKING TOE CALKS FOR HORSESHOES.—Ethan R. Cheney, South Boston, Mass.

I claim the dies, B B' and C C', or their equivalent, constructed and operating substantially as described, for the purpose specified.

80,808.—BED SPRING.—Henry F. Clark, Lowell, Mich.

I claim the bed bottom consisting of the double set of slats, F D, when combined and arranged between the blocks, A, and operating with the independent cross pieces, E, and springs, C, in the manner and for the purposes described.

80,809.—MANUFACTURE OF RUBBER AND OTHER COATED CLOTH AND FABRICS.—John W. Cobb, Melrose, and Edwin A. Hill, Quincy, Mass.

We claim the combination of mechanism for spreading rubber or a vulcanizable material on a surface or cylinder, and applying the coating to cloth, in manner as set forth, with mechanism for vuleanizing the coating of rubber or vulcanizable material, while it with the cloth may be passing about the surface or cylinder on which the rubber or said material may be spread.

Also, the combination and arrangement of the steam jacket or heater. K, with the steam heating cylinder, A, and the two cylinders, E H, arranged and connected so as to operate as and for the purposes specified.

Also, the combination and arrangement of the air protective space, r, the steam chamber, r, q, and the steam cylinders, A E H, arranged and connected so as to operate substantially in manner and for the purposes as specified.

Also, our process of applying rubber or caoutchoue or a vulcanizable material to cloth, and vulcanizing such rubber or material after such application of it, the same consisting in spreading the rubber or vulcanizable material on a cylinder and forcing a sheet of cloth in contact with the coating so spread, and vulcanizing it while on the cloth, and while the latter with the rubber or vulcanizable material may be passed about the cylinder, such vulcanizing of the rubber or its equivalent being effected by heat applied to the cylinder or cylinders used in the process of spreading the rubber, as set forth, or to them and a steam jacket, as described.

Also, the process of making a sheet or rubber or vulcanizable material, and vulcanizing it, the same consisting in spreading the rubber or material on a cylinder by means as described, and vulcanizing the rubber while on such cylinder by heat produced therein, by means of steam let into it as set forth, or into it and a steam jacket arranged with it as specified.

80,810.—LOOM.—George Crompton, Worcester. Mass.

I claim in combination with the harness levers operated by hooked jacks, angular lifter, and depresser levers, the inclination in which is effected by pins or projections from arms, l, working in or against inclines, u, substantially as described.

Also, the eveners, in combination with the inclines, constructed substantially as described, for producing the inclination of the evener levers.

Also, the adjustable inclines for varying the extent of inclination of the levers, substantially as described.

80,811.—MEAT CHOPPER.—Andrew J. Curtis, Monroe, Me.

I claim the arrangement of the impelling pawl, N, the arm, O, the ratchet, P, the spring, I, the knife lever, D, and the cams, d E', as applied to the knife or knives and the tub, as set forth.

Also, the arrangement and combination of the depressing spring, I, its abutment, K, and adjusting screw, L, with the knife lever, D, and the series of cams, E', for operating it, as set forth.

Also, the arrangement of the studs, d' b b; and the holes, f g g, with the tub B, and the ratchet, P, arranged therewith, in manner and so as to be operated by an impelling pawl driven by the knife lever, as set forth.

80,812.—DRILL STOCK.—C. M. Daboll, New London, Conn.

I claim the arrangement of the several parts as herein described, the rest, B, pocket, k, and flanged plug, m, being included in said arrangement.

80,813.—ROTARY EXCAVATOR.—James Deveraux, Marshall, Mich.

I claim an excavator composed of the standards, A, table, B, disk, 7, sheave blocks, E and F, sweep, Z, frame, K, buttons, O, pins, P, stirrups, L, hinges, N, excavator buckets M, bearing wheels, Q, chains, W, ropes, X, the vertical rotating shaft, D, metallic point, C, horizontal arms, G, adjustable guide wheels, H, dogs, S, springs, T, pulleys, V, cord, U, and capstan, Y, when arranged and operating substantially as described and for the purpose specified,

80,814.—SAD-IRON SUPPORT FOR STOVES.—Andrew Dickey, Albany, N. Y.

I claim a removable sad-iron bracket B, constructed and adapted for being applied to a stove substantially as described.

80,815.—MOTIVE POWER FOR SEWING MACHINES.—A. H. Enholm, St. Louis, Mo.

I claim, 1st, The drums and springs when the same are operated by the lever and intermediate pinion wheel, substantially as described, as and for the purpose specified,

2d, The drums, L L', with their springs, when the same communicate their power to the main driving shaft of the machine, through a system of intermediate gearing and the whole is so combined and arranged as to operate substantially as described, as and for the purpose specified.

3d, Regulating the speed of the machine by means of the sleeve, E, lever, G, and fan blades, F F, when the same are constructed and arranged so as to operate substantially as described.

80,816.—COFFIN.—Jefferson E. Evarts, Madison, Conn.

I claim the application of the substance known as papier-mache, to be used in the construction and manufacture of coffins, substantially as and for the purpose above specified.

80,817.—BRICK MACHINE.—John A. Falconer and Robert Graham, Jersey City, N. J., assignors to Egbert C. Bradford, James H. Renick, and Obadiah A. Clough, New York city, assignors to J. H. Renick.

We claim, 1st, The adjustable pin, f, and adjusting holes, f', in combination with and placed in the toothed segment which gears into the rack rod that operates the plunger, substantially as and for the purposes described

2d, A yielding spring connection, substantially as described, between the rock shaft which operates the pusher frame to drive out the molds and the crank which transmits the driving power of the machine to said rock shaft, said yielding spring connection having sufficient rigidity to maintain its position when the pusher frame and molds are not obstructed by stones or by accidental lateral projection of the molds, and sufficient elasticity to yield to such obstructions, in order to prevent breakage of the machine, substantially as described.

3d The hinged hook, L, made in the form substantially as described and shown, the spring, S, and the adjustable clamp, in combination with the connecting rod, M, and crank pin, g, of the crank, K, connected with the driving power of the machine, substantially as and for the purposes described.

80,818.—MAKING BRAID.—Joseph Fletcher, Providence, R I.

I claim my improved mode, substantially as herein described, of making braid by a braiding machine, such involving the making it of single strand yarns, and the arrangement of the twists of a portion of them in directions opposite to those of the rest, the same being as and for the purpose specified.

80,819.—MANUFACTURE OF SUGAR FROM SORGHUM JUICE.—Addison L. Folger and A. Smith Folger, Sumner, and Henry Henshaw, Quakertown, Ind. assignors to A. L. Folger.

We claim, 1st, The arrangement of a consecutive series of filters, A, C, and a consecutive series of precipitating troughs and connecting pipes, and of a series of evaporating pans, two at least of which are connected through a hot filter, substantially as set forth.

2d, In combination with a series of evaporating pans, a water cistern, N, and series of pipes for conducting the water into the pans, substantially as and for the purpose set forth.

3d, A transparent granulator, O, substantially as and for the purpose set forth.

80,820.—HOSE COUPLING.—Loren B. Forester, Clyde, Mich.

I claim the pipe, B, attached to and surrounding the pipe, A, the packing, C, the cars, D, the dog levers, E, provided with shoulders, F, and catches, N, to form that part of my coupling attached to the pipe, A, when operating substantially as and for the purposes herein described.

Also, the coupling pipe, H, provided with shoulder, I, ring, J, pin, K, slot, L, spring, M, in connection with pipe, G, when constructed and operating to form the other part of my coupling.

Also, the combination and arrangement of all the above named parts to form the two parts of a coupling, when constructed and operating, substantially as and for the purposes herein set forth.

80,821.—STEAM BOILER FURNACE.—Jerome B. Gardner and Charles H. Swain, New York city.

We claim, 1st, The combination of the feed chambers for the furnaces of steam boilers, with the perforated pipes and connectors, E, which are protected by suitable coverings, as described and set forth.

2d, The arrangement of the grate bars, F F, upon a concave frame, causing the fuel to fall to the center, in combination with the feed chambers and air-pipes and conductors, as described and set forth.

80,822.—ARTIFICIAL TEETH.—Jethro J. Griffith, Philadelphia, Pa.

I claim the above described mode of effecting the attachment of pins to artificial teeth in the process of molding.

80,823.—DUMPING CART.—Rufus Ham and Joseph Durgin, Bangor, Me.

We claim the spindle-headed post, E, and the plate or circle, F, in combination with the rocker, H, and the trundles, I I' and I'', constructed and operating substantially in the manner and for the purpose as shown and described.

80,824.—SAW MILL.—Martin Hillabold, Syracuse, Ind. Antedated August 1, 1868.

I claim the side rails, g g, of the saw carriage, E, constructed in the manner and for the purposes substantially as described and set forth.

80,825.—BASKET.—Horace C. Jones, Dowagiac, Mich.

I claim, 1, Constructing a basket of two thicknesses of staves or splints, the outer thickness or covering being composed of splints which extend from side to side of the basket, beneath its bottom, and the inner thickness or lining being composed of splints which extend from the center to the bottom of the basket to its top edge substantially as described.

2d, The cap, h, and rivet g, fastening the tapering points of the lining-splints, b, down to the splints, a, forming the outer thickness of the basket, substantially as described.

80,826.—MACHINE FOR CLEANING COTTON.—John Kershaw, Paterson, N. J.

I claim, 1st, The shaft, C, with its disk plates, H, and beater blades, I, in combination with the conically-disposed grating, B, covering, E, openings, K and F, and the outlet or discharge pipe, L, all constructed as and for the purposes herein set forth.

2d, The fan, P, screen, O, and apron N, when combined together, and with with the conically-disposed grating, B, of angular section, the cover, E, the feed opening, K, air opening, F, outlet pipe, L, shaft, C, disks, H, and beater blades, I, or their equivalents, all arranged and operating substantially as and for the purposes herein shown and set forth.

80,827.—WAGON SEAT.—Israel Kinney, Detroit, Mich., assignor to Edward McGivern and John Webber, Hamilton, Canada.

I claim the ribs or lugs, E, when constructed and connected as herein set forth.

80,828.—MACHINE FOR TRIMMING THE EDGES OF BOOTS AND SHOES.—Richard C. Lambert, Raynham, assignor to David Whittemore, North Bridgewater, Mass.

I claim the combination of the jack or shoe-holding carriage, B, the pattern, the stop bolts, n n, and the cutter carrier, N, provided with mechanism for operating them, substantially as specified, such carrier being provided with a gage, y, a paring knife, x, or the same and another tool or implement for smoothing or finishing the edge of a sole of a shoe.

80,829.—MACHINE FOR BEAMING HIDES.—Patrick Lennox, Lynn, Mass.

I claim, 1st In a machine for beaming hides, or sleeking or dressing leather, actuating the movements of the working tool by means of the connecting rod, g, and eccentric rod, b, the former being pivoted at one end to the sliding carriage, and the latter to the beaming tool carrier, and both being connected with the balance wheel by the means above described, the whole being arranged and operating as before described.

2d, The application of the elastic apron to the revolving tablet, in manner and for the purposes as hereinbefore explained.

3d, Applying the revolving tablet to the car-truck frame, in such manner as to be enabled to adjust its vertical positions, substantially as herein shown and described.

4th, The means of accomplishing this vertical adjustment of the revolving tablet, the same consisting of the cross frame, o, and treadle, p, combined and arranged and operating as before explained.

5th, The inclination of the outer end of the horizontal beam or guide for elevating the beaming tool, substantially as before explained.

80,830.—FOLDING MOSQUITO FRAME.—Sebeus C. Maine, Boston, Mass.

I claim the folding frame, B, with cloth, C, and netting, D, attached, in combination with the roller, A, and weight, E, the whole operating substantially in the manner and for the purposes specified.

80,831.—GRIDIRON.—C. H. Mock (assignor to himself and Israel Dixon) Quincy, Ill.

I claim the spider, A, cover, B, projection and staple, b, air-passage, C, and openings, c c, for the purpose substantially as herein shown and described.

80,832.—STOVE-PIPE DAMPER.—Francis D. Pastorius, Philadelphia, Pa.

I claim, 1st A valve seat and gas escape, in combination with an automatic or self-acting valve, for the purpose specified.

2d, A valve seat and gas escape, in combination with the automatic or self-acting valve, D, and the stove-pipe, flue, or other suitable receptacle, A, as shown.

3d, A valve seat and gas escape, B, in combination with the rod, C, valve, D, and the counterpoise, E, as shown.

80,833.—COMB.—Leonce Picot, Hoboken, N. J.

I claim a double comb, formed by coupling two combs together at their backs by a sliding coupling, so that they may be detached from each other at pleasure by sliding them apart and used as single combs, substantially as hereinbefore described.

80,834.—CLASPS FOR BOOTS AND SHOES, BELTS FOR LADIES' DRESSES, ETC.—Eliza W. Prussia, Marlboro, Mass.

I claim, 1st, The device of a spiral groove in a clasp, in the manner and for the purpose described.

2d, The attachment of a cover to the clasp, substantially as described and for the purpose set forth.

80,835.—PROCESS OF MANUFACTURING SULPHURIC ETHER.—Ferdinand Reuz (assignor to himself and John A. Bayly), Poughkeepsie, N. Y.

I claim the method or process of making sulphuric ether direct from the steam of boiling mashes of corn, barley, or other grains, or molasses, or sugar, substantially as hereinbefore described.

80,836.—MACHINE FOR BURNISHING AND SPINNING METALS.—Frederick J. Seymour, Wolcottville, assignor to himself and E. Miller and Company, Meriden, Conn.

I claim, 1st, A revolving chuck or former, in combination with a tool fitted to yield and move automatically, in spinning or burnishing articles of sheet metal upon said chuck or former, substantially as formed.

2d, The lever, w, in combination with the tool, t, stock, t', and spring for withdrawing said tool from the work, as set forth.

3d, The roll, t, and setscrew, 8, for converting said roll into a burnisher, as and for the purposes set forth.

4th, The arrangement of the tool holding slide, s, nut, r', screw, r, and slide rest, q, and screws, 10 10 10, for the purposes and as set forth.

5th, The tool holding slide, s, tool, t, spring, v, lever, w, slide rest, q, secondary bed, l, bed, k, and hand wheel, p, arranged and applied substantially as specified, for spinning or burnishing articles of sheet metal upon a revolving chuck or former, as set forth.

80,837.—HUB BORING MACHINE.—A. R. Silver (assignor to himself and John Derning), Salem, Ohio. Antedated July 25, 1868.

I claim, 1st, The combination of the radially-grooved chuck plate, sliding griping jaws, J, adjusting screws, H', pinions, H, and center spur wheel, G, substantially in the manner and for the purpose described.

2d, The sections, h h, of the feed nut, fitted in slotted bed, g', applied to a turning box or cap, D, constructed with a neck, g, substantially as described.

3d, The combination of the expansible nut, h, bed, g', neck, e, set screw, e', and stock, E, substantially as described.

4th, The construction of the gage plate, C, with an oblong opening, d, through it, one side of which is screw-cut to fit the mandrel, and the other side is provided with an adjustable screw-cut gib, C, and set screw, c', substantially in the manner and for the purposes described.

80,838.—GANG PLOW.—Andrew Smith and William P. Watson, Portland, Oregon, assignors to William P. Watson and T. J. Carter.

We claim, 1st, The combination of the rod, K, plate, J, through which the rod, K, screws, and which is attached to the hinge joint, I, hinge plate, I, plow beams, F F, and standards and plows, G H, substantially as described.

2d, The combination of the hinged beams, F F, cord, c, rollers, M and N, ratchet, m, pawl, p, and foot lever, r, substantially as described.

3, Attaching the rear end of the tongue to the axle, by means of a clevis, t, and a series of holes arranged as described, by which the draft can be changed, substantially as above set forth.

80,839.—HORSE HAY-FORK.—A. Smith, Schellsburg, Pa.

I claim, 1st, The combination, in a horse hay-fork of the shank, the pivoted teeth, the sliding bar, the vibrating locking lever, and the loop, the combination being and operating substantially as set forth.

2d, The combination of the shank, the locking lever, and the sliding loop, with the slide bar, having a lateral projection on its foot working in the slot of the shank, and pivoted to the teeth by links, for the purposes specified.

3d, The combination, as set forth, of the rectangular slotted shank, the diagonally-arranged spear head, the oscillating teeth, the slide bar, the loop, and the locking lever, for the purposes specified.

4th, The combination, in a horse hay-fork, of a shank, a self-locking lever pivoted on and vibrating parallel with the shank, and a loop sliding on the shank and embracing the shank and locking lever, and operating the latter by its ascent, as set forth.

5th The combination substantially as set forth, with a horse hay fork, of pins and skewers, to be inserted crosswise into the load, to bind together and compress the hay.

80,840.—SCREW-CUTTING MACHINE.—Vinzenz Smith, Middlebury, Ohio.

I claim modifying the structure of the parts of said combination, and combining with said combination the several devices, in virtue of which the apparatus may be used as a drilling machine, as well as a bolt and nut-threading machine, substantially as described and shown.

80,841.—POTATO DIGGER.—W. Stark, White Pigeon, Mich.

I claim, 1st, The angular transverse frame, U, in combination with bars, T hangers, V, connecting bar, 2 2, endless chain, P, and arms, V, when operating for the purpose set forth.

2d, Grated section, X, in combination with grated scoop, 5, box, Y, escapement, W, ratchet, S, all operating as and for the purposes specified.

3d, The combination of the above-named parts with elevator, R, sickle bar, K, pitman, J, crank shaft, F, reel, 1, rollers, H, plate, L, provided with angular projecting arms, 6, when constructed, arranged, and operating substantially as and for the purposes herein set forth.

80,842.—GARDEN HAND PLOW.—John Starr, Grand Rapids, Mich.

I claim a double hand plow, constructed substantially as and for any or all of the purposes specified.

80,843.—LAMP BURNER.—Edwin J. Toof, Madison, Iowa.

I claim, 1st, The springs, F, which are so constructed as not only to act as a support to the elevated cone, E, but at the same time to serve to clamp the chimney, whether the same be hinged to or have spring-snap connection with the foraminous air-sereen, A, substantially as herein shown and described.

2d, The hinge joint, formed by the bend of the spring support, F, in connection with an aperture or depression in the disk, A, or any attachment thereto, substantially as shown and described.

3d, The spring catch, a, formed by the extension of the spring support, F, and arranged in relation to the cone, E, and locking into the central elevated portion of the air screen, or other convenient attachment to the burner, substantially as shown and described.

4th, The spring clamps, F, constructed with variable widths or thicknesses, for the distribution of the spring and holding parts, substantially as set forth.

5th, The clamps, F, constructed of one continuous strip of metal, and serving to support the cone within the chimney, and to support and connect both with the foraminous screen, substantially as described.

6th, The application of the valve, e, to the vapor tube of a lamp burner, substantially as and for the purpose set forth.

80,844.—FIRE GRATE.—John Vandercar, Brooklyn, N. Y., assignor to L. B. Tupper, New York city.

I claim a furnace grate bar, provided with a central longitudinal bar, A, and two series of cross bars, d, the latter running diagonally from the frame, B, to the said central bar, A, and the bars of each series adjoining the said central bar at alternate points, thereby breaking joints with each other, substantially as herein shown and described.

80,845.—CARRIAGE-PROP JOINT.—Elbertson W. Waite, New Haven, Conn.

I claim the carriage-prop, made with the link, c, attached by the pins or screws, d d, to the bars, a and b, in the manner and for the purposes specified.

80,846.—SLATE FRAME.—Charles Wendell, Albany, N. Y.

I claim the application of cushion rings, C, to the frame of a slate or writing tablet substantially in the manner and for the purpose described.

80,847.—MEASURING FAUCET.—Orren L. Wheeler, Lewiston, Me.

I claim the measuring faucet, as described, having the chamber, B, with vent hole, o, gaged stock, i, disk, k collapsible tube, m, projection, a, with opening, 2, in combination with the nozzle, C, having the socket, b, to receive the projection, a, all as and to operate for the purposes herein set forth.

80,848.—APPARATUS FOR SETTING AXLES OF WHEELS.—Samuel Woodhull, Linden, Mich.

I claim the arms, K, in an axle gauge, constructed as herein described and shown.

80,849.—RING-SPINNING FRAME.—John Ashworth (assignor to George L Davis, John A. Wiley, and Joseph M. Stone), North Andover, Mass.

I claim the ring, secured to the rail, and adjustable to the spindle by the clamping screw and two set screws substantially as described.

80,850.—BRICK MACHINE.—Theodore Barker (assignor to Japhet Lingenfelter), Mexico, N. Y.

I claim, 1st Combining with the two tables, F and E, arranged at right angles to each other, and the two followers, S and G, the connecting rod, I, vibrating lever, J, and slotted, J, arranged and operating substantially in the manner and for the purpose specified.

2d, The arrangement of the slotted side table, F, ledges, v v, follower, s, suspending guide ways, l, and the suspended follower, G in a brick machine, substantially in the manner herein shown and described.

3d, The combination and arrangement of the guide rods, e e, applied to the plunger, B2 and provided with stops, f' f', the cross head, f, its connections with the driving shaft, the adjusting screw, g, and tubular socket or sleeve, g1, all substantially in the manner and for the purpose described.

4th, The belt, K, with its necessary adjuncts between the spur-geared driving power of the pug-mill and press, and the mechanism, constructed and arranged substantially as described, for bringing the mold boxes into proper position, in the manner and for the purpose substantially as set forth.

5th, The combination and arrangement of the devices set forth for automatically feeding, elevating, and discharging clay into the pug-mill, in the manner substantially as and for the purposes described.

80,851.—LAMP.—John Barson, Ephraim Daniels and Joanna Farrell, New York city.

We claim, in combination with the ordinary stationary roller, D, the roller, D', mounted on a sliding box, G, operated by the swiveling screw, K, substantially as and for the purpose described.

80,852.—MEASURING FAUCET.—Oscar B. Blake and Ormond E. Colony, Keene, N. H.

We claim the inclined tube or induction pipe, A, and converging measuring receptacle, B, in connection with the faucet, having an outer casing, C, with orifices, D E and F, and a semi-rotating plug, C', having chambers, H and I, and stop pin, L, arranged so as to form alternately the induction and eduction passages for the supply and discharge of the liquids to and from the measuring receptacle, B, the same being provided with passages M and N, or their equivalents, for the admission of air to supply the place of the liquids as they are drawn from the can or reservoir, the whole being constructed and arranged substantially as herein shown and described.

80,853.—KNITTING MACHINE.—Charles W. Blakeslee and Anthony G. Davis, Watertown, and Ebenezer B. Beecher, Westville, Conn.

We claim the combination, with a thread-carrying arm or bar, of a swiveling support, substantially as described, which is arranged to slide upon said arm to admit of its being held in proper place while going around the end of the machine.

Also, the combination, with such an arm and a swiveling support, of an adjustable rod or rods, for arresting the range of travel of the yarn delivering eye, and causing the arm to turn around the end of the machine.

Also, the combination, with such thread-carrying arm, of an automatic locking and releasing device operating substantially as and for the purpose set forth.

Also, the combination with such thread-carrying arm, of a tubular eye, constructed to serve as a pin or pivoting center for the thread-carrying arm, as well as to perform its duty of supplying yarn to all the needles which are brought into action for knitting.

80,854.—OINTMENT.—Joseph Bogan and John B. McCray, Clarksville, Ohio.

We claim the within-described compound, when mixed and used, substantially as and for the purpose specified.

80,855.—MACHINE FOR SAWING COMBS.—George F. H. Brown (assignor to the Union Comb Company), Leominster, Mass.

I claim, 1st, The combination of the shaft, F, having the cams or eccentrics, G and F' on it, and the two saw frames, H and H', with saws, A and A', for the purpose of cutting both sides of a comb at the same time, the parts being constructed and arranged substantially as shown.

2d, In combination with the saws, A and A', the automatic arrangement of the pointers, D and D', substantially as and for the purpose shown.

80,856.—STREET PAVEMENT.—Philip Caduc, San Francisco, and W. H. De Valin, Sacramento, Cal.

We claim, 1st, The application to a cobble stone pavement or walk, of the herein described composition, substantially in the manner set forth.

2d, The tapering or inclined sided blocks, molded and formed from the composition herein described, in the manner set forth.

3d, A pavement or walk made of composition block, molded and formed a set forth, and united and cemented together after being laid or placed in position, in the manner specified.

80,857.—PLATFORM SCALE.—John Decker, Sparta, N. J., assignor to J. B. Boss and C. C. Clark.

I claim, 1st, A combined platform and spring balance scale, made and operating substantially as herein shown and described.

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2d, The yoke shaped lever, when pivoted at its end to stationary uprights, which in middle portion is suspended from a spring, the weighing platform being suspended from the lever, between the supported and suspended part of the same, substantially as herein shown and described.

3d, The combination of the elastic straps, b b, with the curved plates, c c, for the purpose of suspending the platform from the yoke-shaped lever, substantially as herein shown and described.

4th, The arrangement and combination with each other, of the platform, D, straps b b, plates, c c, lever, A, uprights, B, and spring balance, C, all made and operating substantially as herein shown and described.

80,858.—CAR TRUCK.—J. H. Densmore, Boston, Mass., assignor to himself and Hiram Fuller, Hallowell, Me.

I claim the construction and arrangement of safety sleeve, H, substantially as shown and described, in combination with the axles and wheels of car or tender trucks, when the said sleeves are made in two parts and affixed to safety beams, ff, all as set forth.

80,859.—PLOW.—John G. Fetzer, Bruswick, assignor to Fetzer & Woodson, St. Louis, Mo.

I claim the land side, D, when constructed with the assembling bars, d and d', the whole being arranged as herein shown and described.

80,860.—DISTILLING SPIRITS FROM GRAIN. William Hutson Ford, J. Dickson Bruns, and L. C. Clarke, New Orleans, La.

We claim the process of neutralizing the acid and controlling the fermentation of mash from grain, or other farinaceous substance, which has been boiled or otherwise treated with acids for the purpose of effecting a more complete saccharification, whereby the usual loss of alcohol is obviated, by the means and in the manner substantially as set forth.

80,861.—SEWING MACHINE.—George H. Fox and Joseph Hubbard, Boston, Mass.

We claim, in combination with the adjustable fulcrum and guide plate, m, and the adjustable stripper plate, J, the screw and nut, arranged to hold both plates in position, substantially as shown and described.

Also, in combination with the two plates, m and j, and the screw and nut, the friction spring, q2, arranged to operate substantially as shown and described.

80,862.—BRICK MACHINE.—Fred E. Frey, Bucyrus, Ohio, assignor to himself, D. J. Sheckler, and James M. Kelley.

I claim, 1st, The lever, j, compressible plunger, X, spring, L, nut, M, lever, O, the rack shaft, A, and pinions, q q, racks, P P, and press board, G, when constructed, combined, and arranged in the manner and to operate substantially as described.

2d, In combination with the rack shaft, A, pinions, q q, and racks, P P, the adjustable plate, y, friction rollers, e e, and set screws, f f, when combined and arranged as described, and to operate in the manner and for the purposes set forth.

80,863.—SPINNING MACHINE.—James E. Hooper, Woodbury, Md., and Benjamin Arnold, East Greenwich, R. I.

We claim, 1st, The combination of the bar, o, or its mechanical equivalent, with the ring rail, for the purpose of throwing off the empty bobbins, substantially as herein set forth.

2d, The combination, with a spinning machine, substantially as described, of the notched bar and sliding thread separator.

3d, The rail, k, and the mechanism for operating it, all constructed substantially as described, and for the purpose set forth.

80,864.—FRUIT PICKER.—N. G. Hughes (assignor to himself and Thomas Braden), Waynesburg, Pa.

I claim the lid or cover, D, spring, E, ring, B, hose, F, and cord, G, constructed and arranged as described, for the purpose specified.

80,865.—PRINTING PRESSES.—J. M. Jones, Palmyra, N. Y., assignor to himself, Henry Johnson, and George M. Bowman.

I claim, 1st, The arm or arms, N, or its or their equivalents, in combination with the platen, Q, or its equivalent, when arranged to engage with the said platen and to draw it against the form to which it has been previously raised substantially as and for the purpose described.

2d, The rocker arm or arms, Q2, or its or their equivalents, arranged for operation upon the arm or arms, N, or equivalent therefor, substantially as described for the purpose specified.

3d, The lever or levers, M3, or equivalent therefor, when arranged for operation upon the rocker arm or arms, Q2, of the lifting device to the impression arms, N, substantially as and for the purpose described.

4th, A movable book or clasp for holding the chase to the bed of the press, when operated by lever, a, and arranged for operation substantially as specified.

5th, The lever, G3, or its equivalent, in combination with the frame carrying the ink rollers to the press, when arranged for operation therewith, substantially as and for the purpose described.

6th, A box or receptacle, in combination with the frame carrying the platen when arranged thereon for operation, substantially as and for the purpose set forth.

80,866.—KNITTING MACHINE.—Samuel Larkin (assignor to Bridgeport Knitting Company), Bridgeport, Conn.

I claim the finger, d, constructed and operated as described, so as to carry the threads over any given number of needles to form the stitches in the relative position to each other, substantially as set forth.

80,867. COOKING STOVE.—John Magee, Chelsea, Mass., assignor to Magee Furnace Company.

I claim a roasting closet, C, with a movable lid at its top, when said roasting closet is placed over or above a warming closet, F, and in front of the fire chamber of a cooking stove, substantially as and for the purpose set forth.

80,868.—HAND AX.—Edmond H. Meigs (assignors to Roys, Wilcox, & Co.), East Berlin, Conn.

I claim a hand ax, produced substantially as described, as an improved article of manufacture.

80,869.—SHIPS' DAVIT.—Christian Gotthold Meinhardt, Altoona, assignor to himself and Benjamin F. Bell, Antistown, Pa.

I claim the casing, B, in one end which swings the davit, A, provided with a caster, g2, swinging around the bar, G, which is secured by the three pointed foot, g1, and hook, H, and operated by the sleeve, I, substantially as and for the purposes described.

80,870.—HORSE HITCH.—William A. Middleton and John A. Haller, Harrisburg, Pa.

We claim, 1st, So forming the slot, K, in the top of the frame, O O', as to serve the several purposes, substantially in the manner as herein set forth.

2d, The adjustable floor, Z Z', provided with the trunnion rests, n n', and the serrated part, 1, 2, 3, etc., in combination with the frame, W W', substantially as herein set forth.

3d, The holder, S, when made with the equidistant wings, a a', and the thumb piece, R, in combination with the frame, O O', W W', and floor, Z Z', for the purpose specified.

80,871.—SAW-SET AND GAGE.—W. B. Noyes and C. S. Baker, Manchester, N. H.

We claim the within described device for gaging and setting the teeth of saws, substantially as described.

80,872.—DOUBLE-TREE.—Horace Palmer and Asa N. Case, Kingsville, Ohio

We claim the brace rod, D, whose ends enter recesses in the rear edge of the wooden bar, A, and are connected therein by the clevises, B, when said rod is adjusted nearer to or farther from the bar by the eye bolt, E, embracing its center, as herein shown and described.

80,873.—STUMP MACHINE.—Isaac Pardee (assignor to himself and Orson Reed), Buena Vista, N. J.

I claim, 1st, The machine, consisting of the frame, A, having the shaft, B, with the wheels, C, mounted thereon, with the levers, E F, stirrups, I, and pawls, c, constructed and arranged to operate substantially as described.

2d, In combination with the levers, E, and stirrups, I, the levers, c, arranged as described, for raising the stirrups from the wheels, C.

3d, The pivoted handles, H, provided with the stop rod, l, and arranged to operate as set forth.

4th, The hinged bars, h, for supporting the levers E, when arranged as shown and described.

80,874.—WATER-WHEEL.—O. M. Pike (assignor to himself and S. S. Graves), North Leverett, Mass.

I claim the rotary slotted drum, or cylinder, J, in combination with the wheel, B, and case, C, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

80,875.—WELL TUBE.—Edwin A. Platt, Bristol, and George Platt, East Hartford, assignors to themselves and Linus Wilcox, Middletown, Conn.

We claim a well tube, having lateral perforations and pebbles caged in the lower section, when so arranged that the pebbles shall be moved in their position by the action of the pump, all substantially as and for the purpose described.

80,876.—MECHANISM FOR OPERATING HARNESS IN LOOMS.—Osgood Plummer and James Schofield, Worcester, Mass.

We claim, 1st, The combination, with the double slotted cam piece, F, of the slotted arm, f, and connection, H, substantially as and for the purposes set forth

2d, The combination, with the arms, D D, of the plates, E E', or their equivalents, substantially as and for the purposes set forth.

3d, The combination, with the arms, D, and plates, E E', for lifting and depressing the bars, L, of the pieces, C and B, with which the front ends of said arms are connected, substantially as and for the purposes set forth.

4th, The combination, with the bar, L, or their equivalents, of the lifting and depressing plates, E E', and arms, D, substantially as and for the purposes set forth.

5th, The combination, with the bars, L, of the roll, N, or its equivalent, substantially as and for the purposes set forth.

6th, The combination, with the mechanism which works against the pattern wheel or chain of a fancy loom, of mechanism for freeing the pattern wheel or chain from contact with said mechanism, for the purposes set forth.

7th, The jacks, J, provided with the slots, 12 and 13, substantially as and for the purposes set forth.

8th, The combination, in a fancy loom, having elevating and depressing arms, working on fixed fulcra forward of the cloth-making point, of a series of jacks, constructed substantially as described, combined with a series of harnesses by means of cords, or their mechanical equivalents, passing over a roll or rolls, L", so as to give to the harnesses a greater throw or motion than is imparted to the lifting and depressing arms, for the purposes set forth.

9th, The combination, with a jack, J, and bar constructed as described, of a spring, 15, substantially as and for the purposes set forth.

10th, The combination, with a jack, J J', of a bar, L, having two front projections, i and j, and a rear projection, k, substantially as and for the purposes set forth.

80,877.—HYDRAULIC PRESS.—George W. Rawson, Cambridgeport, Mass., assignor to himself and Michael Hittinger.

I claim the combination of the platform, G, hydraulic press, C D, rods, a, and plate, H, arranged to operate substantially as described, for the purpose set forth.

80,878.—SWITCH AND SIGNAL.—John Saxby and John Stinson Farmer, Kilburn, England,

We claim a series of levers, and the within described slides or their equivalents, combined with the switches and signals of a railway junction, substantially as set forth, the whole being arranged and so operating that, after a change in the position of a switch the levers, connected to signals properly displayed to indicate the condition of the road, are locked in their positions, while the remaining levers may be adjusted so as to change the position of the signals or switches which are improperly arranged, all substantially as specified.

80,879.—HARVESTER RAKE.—Frank Schurger and Nicholas Allstatter, Hamilton, Ohio.

We claim, 1st, The combination of the catch, L, sliding bearing, I, and frame or quadrant, K, with each other and with the stop, U, rake shaft, H, and shaft C, substantially as herein shown and described, for the purpose of preventing any motion of the said shaft, H, but one revolution on its axis while the rake head is sweeping over the platform.

2d, The combination of the curved racks, P and R, with each other and with the frame, K, and rake shaft, H, substantially as herein shown and described, for the purpose of partially rotating the shaft, H, and causing the rake head to sweep over the platform.

3d, The combination of the fingers, N and M, with each other and with the shaft, H, and catch, L, substantially as herein shown and described, for the purpose of releasing the catch, L, from the stop, U, at the proper time.

4th, The combination of the clutch, Y, lever, A', and arm, B', with each other and with the shaft, C, collar or sleeve, W, and frame or quadrant, K, substantially as herein shown and described, and for the purpose set forth.

80,880.—MACHINE FOR CUTTING OPEN DITCHES.—Jasper N. Smith and William O. Buckley, Washington, Ill.

We claim, 1st, The hanging the dircher in a frame, as shown in the drawings, thus avoiding the use of a beam, and avoiding all clogging under the beam in machines which make use of it.

2d, The movable slides, A A, in connection with the movable knives, B B, so constructed as to carry out a greater or less width of earth as the machine is cutting.

3d, The form of the rear of the nose, that is, the rear carried up, as shown, to avoid friction, and expanded, as shown, to support the slides.

80,881.—COOKING UTENSIL.—Julius Smith and Isaac E. Hall, Logan, Ohio.

We claim conducting the lid of a steamer by means of spiral springs, whereby all danger from excessive pressure of steam is avoided, substantially as herein set forth.

Also, the cooking apparatus, composed of the reservoir, A, cover, B, lining, C, shell, D, stand, E, vessels, F, and springs, G, when constructed in the manner and for the purpose substantially as herein specified.

80,882.—CHURN.—Joseph Stadler, Detroit, and George M. Streng, Plymouth, Mich.

We claim, 1st, The vessel, A, in combination with the rotating dasher-shaft F, and revolving dasher-wings or boards ff, and the shifting wings, a, substantially as shown and described, and for the purposes set forth.

2d, The shifting wings, c, in combination with the vessel, A, substantially as shown and described and for the purposes set forth.

80,883.—RADIATOR.—William Steffe (assignor to himself and Jesse Reynolds), Philadelphia, Pa.

I claim a permanent wrought iron drum or radiator, constructed substantially as herein specified.

80,884.—SECURING MASTS OF VESSELS.—D. S. Stevens and Lambert Snedecor, Red Bank, N. J.

We claim supporting the masts of vessels in flexible and elastic partners and steps, substantially as and for the purpose described.

80,885.—STOP MOTION FOR LOOMS.—John J. Switzer, Roxbury, assignor to himself and Edwin H. Fittz, Northborough, Mass.

I claim, 1st, The wings, K K, constructed substantially as described, and provided with the warp supporting cords or rods, in combination with the rising and falling board, as and for the purpose set forth.

2d, The flat board, H, the vertically movable frame, F, and the wings, K, as and for the purpose set forth.

3d, The vertically movable frame, F, carrying the flat board, H, and the shaft, G, substantially as herein shown and described.

4th, The lugs, r, projecting from the flat board, in combination with the lugs, p projecting from the rock shaft, G, all made and operating substantially as and for the purpose herein shown and described.

5th, The slide, J, connected with the shifting lever, I, spring, e', and elbow crank, N, substantially as herein shown and described.

6th, The devices herein shown and described, for transferring motion from the rock shaft, G, to the elbow crank, N, said devices consisting of the lever, M, cord, t, pin, v, hook, z, frame o, and string, y, all made and operating substantially as herein shown and described, in combination with the vibrating lever, R, and block, S, made as set forth.

7th, A thread detector consisting of the wings, KK, threads, m, frame, F, shaft, G, flat board, H, lugs, p r, cam, d', lever, M, string, t, pin, v, hook, z, frame, o, cord, y, elbow, N, slide, J, and shifting lever, I, all made and operating substantially as herein shown and described.

8th, The swinging arm, M, cord, t, pin, v, and block, m, in combination with the hook, z, having the inner projection, a', and hinged in the frame, o, and combined with the slide, S, all made as set forth.

80,886.—HEAD FOR BARRELS.—Merritt L. Thompson (assignor to himself and John P. Rittenhouse), Flemington, N. J.

I claim, 1st, A movable head for barrels or casks, formed in sections, with the last section that is introduced resting upon rebates, or the beveled edges of those previously introduced, and held down by a turning button, or equivalent clamp, substantially as set forth.

2d, A turning button applied to the inner side of a sectional head, and fitted substantially as specified, so as to be turned from the outside of said head and secure the sections in place, substantially as set forth.

80,887.—KNITTING MACHINE.—James Waldie (assignor to himself and Geo ge Kennedy), Ipswich, Mass.

I claim a ratchet wheel, G, with a single cam or eccentric, H, operated by a single driver, F, for weaving an even number of courses of three or four colors, substantially as set forth.

Also, a ratchet wheel or disk, P, provided with three or more flanges, constructed as described, in combination with a corresponding number of levers, R R, and operated by two drivers, B, for weaving odd or even courses of three or more colors, substantially as and for the purposes specified.

80,888.—SPIRIT METER.—Joel D. Weaver (assignor to himself, C. A. Sherwood, and L. S. Bunnell), Troy, N. Y.

I claim, 1st, the improved valve actuating mechanism, substantially such as herein shown and described, for the purpose set forth.

2d, The improved valve, K, in combination with the valve chest, I, provided with ports, arranged substantially as and for the purpose described.

3d, The combination of the sliding rod, E, valve stem, e, and spring actuated arm, f, substantially as and for the purpose described.

4th, The combination with the arm, f, of the tube, G, provided with the springs, K and K', and actuated by the slide, E, substantially as and for the purpose described.

80,889.—SEWING MACHINE.—Wm. C. Willmarth (assignor to B. W. Lacy & Co.), Philadelphia, Pa.

I claim the revolving disk, k, arm, L, carrying a detachable needle, n, and the adjustable slotted plate, I', in combination with the vibrating lever, o, its plate, Q, projection, q, and the adjustable stop, t, the whole being constructed and operating as and for the purpose described.

80,890.—BRICK MACHINE.—Philip N. Woliston, Springfield, Ohio, assignor to himself and Ferrell, Ludlow & Rodgers.

I claim, 1st, the die, A, in combination with rods, D, arranged in relation thereto substantially as and for the purpose set forth.

2d, Forming the mouth of the die with projections in the middle of the sides at A', substantially as and for the purpose set forth.

80,891.—GLOBE.—Gorham D. Abbot, New York city.

I claim a globe constructed of flexible material, and distended by means of an elastic inflatable rubber bag, or with cork, hair, sponge, or other light elastic substance, substantially as described.

80,892.—CORN PLANTER.—Henry Ackerman, Pittsburg, Pa.

I claim, 1st, Supporting the rear of the planter by a single wheel, B, mounted on a rigid frame, in combination with the side wheels, O, mounted on hinged frames, substantially as and for the purpose described.

2d, The cultivators, m', secured at their upper ends to the angular levers, m, substantially as and for the purpose described.

3d, The removable T-shaped marker, substantially as and for the purpose described.

80,893.—SECRETARY.—Ezra Ale, Clearfield, Pa.

I claim the combination with a secretary or bookcase, of the movable shelves or cases, H, belts, G, and pulleys, E and F, substantially as and for the purpose described.

80,894.—CLAMP.—Andrew Anderson, Madison, Wis.

I claim the combination of the cams, C C, the jaws, A A, the lever, E, the yoke, H H, and the plunger, F, all constructed, arranged, and operating as and for the purposes herein set forth.

80,895.—MACHINERY FOR PRINTING YARN.—Carl F. Austel, New York city.

I claim the movable carriage B, carrying two rollers a, and a rack, c, in combination with printing rollers, e f, suspended in the standard, g, substantially as and for the purpose herein shown and described.

80,896.—TORPEDOES FOR OIL WELLS.—Alexander T. Ballantine, Titusville, Pa.

I claim, 1st, The hollow and loaded exploding plunger, E, acting by the pressure of the water on its end, to ignite the charge, substantially as specified

2d, The combination of the hollow and loaded exploding plunger, E, with the close cylinder or pocket, D, arranged to project down within the body or magazine, A, said plunger and pocket being so constructed as that the latter forms an anvil, and the former carries a percussion cap or pellet, for operation together, to fire the charge in the plunger, and through the bursting of the latter and its pocket, also the charge in the body or magazine, A, essentially as herein set forth.

3d, The combination of the free or independent exploding plunger, E, with the body, A, and its bail, C, in such manner as that the torpedo is or may be suspended through a loop made in the lowering wire or rope, directly by said plunger, and indirectly by or through its bail, substantially as shown and described.

80,897.—SAFETY BRIDLE.—G. W. Barnes, Mount Vernon, N. Y.

I claim the supplementary straps, E, detachable and adjustable, as applied and combined with the single check strap, A, of the safety bridle, substantially as and for the purpose herein described.

80,898.—TABLE, DESK, ETC.—Elias Becker, Pittsburg, Pa.

I claim the combination with tables, desks, or other similar articles, of the sliding frame, B, provided with the tablet, C, and spring, E, substantially as and for the purpose described.

80,899.—BELT KNIFE.—Henry Blake (assignor to himself, Geo. W. Blake, Otis Blake, and James Blake), East Pepperell, Mass.

I claim the improved belt punching knife herein described, as a new article of manufacture.

80,900.—MACHINE FOR PUNCHING AX POLLS.—Robert Blake, Scranton, Pa.

I claim, 1st, In a machine for punching ax polls and other tools, the combination with the punching pin and squeezing dies of a bit-end former or die, constructed as herein specified, and applied to the end of the dies in which the bit end of the polls is received or shaped in the manner described; that is to say, so that when the squeezing dies are brought together, the said "former" shall completely close the said end of the dies, substantially as herein shown and set forth,

2d, The combination with the shears of the edging dies or formers operating in connection therewith, in the manner described, so that the poll shall simultaneously be "edged" and severed from the stock, substantially as herein shown and set forth.

3d, The combination of the shears and edging dies with the cross head which carries the squeezing dies, under the arrangement and for operation as herein shown and specified.

4th, The combination in a machine such as described, of the squeezing dies, "bit end" former, shears, and edging dies, when the same are operated simultaneously from a single cross head, substantially in the manner and for the purposes shown and set forth.

80,901.—ELBOW SUPPORT FOR FLEXIBLE HOSE.—Augustus O. Bourn, Cranston, R. I.

I claim the improved hose rings, A A, constructed and held in connection substantially as described, for the purposes specified.

80,902.—FERRY BRIDGE.—John S. Bradford, New York city.

I claim a platform or grating attached to a ferry bridge, whether submerged, or at or above the surface of the water, constructed substantially as herein described and for the purpose set forth.

80,903.—SEWING MACHINE.—James Briggs, Lyons, Ohio.

I claim, 1st, The shaft, B, with gear wheel, b, sleeve clutch, b1, loose gear wheels, b2, the spring, E, lever, F, shaft, G, with gear wheel, g, and pinion, g', the shaft, H, with gear wheels, h, and roller, h', the whole being combined and operated in the manner and for the purpose described.

2d, The standard, C C, shaft, D, wheel, d, pitman, I, ways, J, and stays, J', in combination with standard, K, shaft, K, and strap, k1, when operated in the manner and for the purpose herein described.

80,904.—METALLIC HEEL PATTERN.—Jacob Brobst, Fort Wayne, Ind.

I claim, 1st, Segments, A A', hinged and operated in the manner and for the purposes described and set forth.

2d, The combination of the hinged segments and curved slotted arm and stud, and set screw, the same being constructed in the manner and for the purpose set forth.

3d, Peforations, a a', on the edge of sections, A A', for the purpose of admitting the point of a sharp instrument, as described, and for the purposes set forth.

80,905.—PUMP.—John Brockenshire, Oswego, N. Y.

I claim, 1st, The internal chamber, E E, in conjunction with suction pipe, D, as arranged relatively with the barrels, A A, plungers, B B, valves, C C, and discharge outlet, P, substantially as herein described and for the purpose set forth.

2d, In combination with the parts above, the opening in the partition, G, said opening being in line with the section pipe, D, as and for the purpose described.

80,906.—APPARATUS FOR CURING TOBACCO.—Nathaniel W. Broome, Baltimore, Md.

I claim the arrangement of escape pipes and deflectors on the shell or jacket of the heater, so that the rising up of the heated air shall be passed outward and through the escaping products of combustion, and the former aid the latter in being uniformly disseminated throughout the curing apartment, substantially as described.

80,907.—SEWING MACHINE.—A. R. Byrkit and C. S. Byrkit, Fairfield, Iowa.

We claim, 1st, The combination with the shuttle face plate arranged obliquely to the feed movement, of the obliquely moving vibrating carrier and double pointed shuttle, substantially as and for the purpose set forth.

2d, The combination of the heart-shaped cam, N, with the feeding mechanism described, for operating the feed, in whichever direction the machine is run, essentially as herein set forth.

80,908.—NEEDLE-SHARPENING ATTACHMENT FOR SEWING MACHINES.—James Callan, Bridgeport, Conn.

I claim, in combination with a bobbin winder of a sewing machine, a grinding wheel, H, arranged upon the revolving mandrel, substantially in the manner and for the purpose set forth.

80,909.—LAMP BURNER.—Wm. Carleton, Boston, Mass.

I claim, 1st, Forming the elevated deflector and the supporting standards upon its periphery in one continuous piece of metal, substantially as and for the purpose set forth.

2d, Forming the elevated deflector, its supporting standards, and the chimney-holding springs in one continuous piece, substantially as herein shown and set forth.

3d, The arrangement of the standards and chimney-supporting springs in alternate order upon the periphery of the deflector, in the manner shown and described.

4th, The combination with the air distributor and the elevated deflector with its chimney-holding springs and standards, of a bent-over ring for holding the deflector to the air distributor, whether the said ring be formed in one piece with said standards, or separately therefrom, as and for the purposes set forth.

5th, The combination of the elevated deflector and its downwardly extending peripheral springs with the chimney and chimney seat and shoulder formed on said seat, or the air distributor to prevent the excessive yielding of said springs, as herein shown and set forth.

6th, The combination with the base and wick tube of a sleeve for supporting the deflector and air distributor, held upon the base and wick tube, in the manner described, and provided near its lower end with perforations or openings for the supply of air directly to the flame, as set forth.

80,910.—FORM BLOCK FOR BASKETS.—W. H. Carpenter, New York city.

I claim the combination of the expanding or movable sections, E, the supporting ring, D, and the conical wedge, B, substantially as and for the purpose herein specified.

80,911.—OIL CUP FOR STEAM ENGINES.—John C. Carroll, Litchfield, Ill.

I claim, 1st, The oil cup, A, when provided with double valves, B1 B2, and an intervening measuring chamber, b1, substantially as herein shown and described.

2d, The combination and arrangement of the screw cap, A1, lever, A4, and valve rods, B b4, substantially as described and set forth.

80,912.—QUARTZ CRUSHER.—Edmund Castle, Lincolnton, North Carolina.

I claim, 1st, The end housing-plates, C C, of a quartz crushing mill, provided with the grooves for holding the side portions, and the inclined tables, D E, and the bottom of the hopper, substantially as and for the purpose described.

2d, The combination, with a quartz mill, of the swinging gate, I, provided with a metal plate, the inclined table, D, and the adjustable plate, f, substantially as and for the purpose described.

80,913.—CARPET LINING.—G. W. Chipman, Boston, Mass.

I claim a carpet lining, the wadding and paper sheets of which are confined together by the lines or spots of cement, substantially as set forth.

80,914.—SHEEP SHEARS.—P. G. Claney, Augusta, Me.

I claim the employment of the center blade, C, constructed with parallel cutting edges, substantially as and for the purpose set forth.

80,915.—AUGER.—Leander Colt, Niagara Falls, N. Y.

I claim the reversible artachment, B B, constructed as described, that is, having a bit at one end, and hollow auger at the other, when operated in connection with the gage, c', and auger, A, substantially as and for the purpose described.

80,916.—COOKING STOVE.—Thos. Colwell, Troy, N. Y.

I claim, 1st, The employment of the rake, C, constructed and arranged with zigzag bars, a, substantially as shown at fig. 6 of accompanying drawings, in combination with the stationary grate, B, and with the ash pan or drawer, A, the whole being arranged in the manner substantially as herein contained, described, and set forth.

2d, The rake, C, so arranged and constructed with zigzag bars, a, substantially as shown at fig. 6 of the accompanying drawings, and in the manner and for the purposes substantially as herein contained, described, and set forth.

3d, The employment of the handle or lever, J, in combination with the rake C, and with the hearth of the stove, so that the rake, C, may be vibrated in a horizontal plane when used in connection with the grate, B, and ash pan or drawer, A, in the manner substantially as herein described and set forth.

80,917.—COOPERS' CROZE.—C. O. Cook Rockford, Ill.

I claim the arm, b, shoulder, b1, and spring, b2, of cutting iron, B, when combined and operated in connection with the head of screw, C, as and for the purpose described.

80,918.—CARBURETER.—M. P. Coons, Brooklyn, N. Y.

I claim, 1st, Saturating the pumice stone and the series of corrugated porous bricks, D, contained in the case, A, with hydrocarbon liquid, and drawing off the surplus liquid by means of the siphon pipe, I, communicating with the distributer, G, as herein described for the purpose specified.

2d, The perforated distributer, G, arranged in the bottom of the case beneath the pumice stone and porous bricks, D, and above the coiled steam pipe, B, as herein described for the purpose specified.

3d, The construction and arrangement of the closed case, filled with pumice stone, and the series of corrugated porous bricks, D, the distributer, G, coiled steam pipe, B, siphon pipe, I, the air pipe, F, extending through the centers of the porous bricks, D, the discharge pipe, K, the air vessel, A, all operating as described, whereby no accumulation of gas is effected, as herein set forth.

80,919.—ROCKING AND RECLINING CHAIR.—David Cox, Cincinnati, Ohio

I claim, 1st, The combination, substantially as described, of the chair, A, rockers, B B', trestles, C C' c c' flexible straps, E E' e e', stops, f f', lear, G g, foot rest, I, and slotted arms, J J' K K' k, or their mechanical equivalents, or the purpose set forth.

2d, In combination with the elements, A B B' C C' c c', E E' e e' f f' G g I and J J' K K' k, the studs, L, and fixed hooks, M, for the object stated.

80,920.—DAMPER.—David B. Cox, Troy, N. Y.

I claim the reversible ventilating check damper, consisting of a damper, F, attached to an extension, c, of the stovepipe, C, projecting in a direction opposite to or different from the said pipe, and reversible with it, substantially as and for the purpose herein specified.

80,921.—CHURN DASHER.—H. A. Crance, Lewisburg, Pa.

I claim the attaching of the cones, C C C C, to the arms of a churn dasher, in the manner and substantially as described.

80,922.—ELECTRO MAGNETIC ALARM.—Moses G. Crane, Newton, Mass.

I claim, in combination with the electro-magnet and its armature the bal and hammer, connected with the armature mechanism, and arranged to be operated substantially as shown and described.

Also, in combination with the striking mechanism, the stops, x y, and fingers a2, or an equivalent locking and disengaging mechanism, substantially as described.

80,923.—LUBRICATOR.—Henry Crossley, Brooklyn, N. Y.

I claim the oil cup, having its upper valve combined with the cover, applied to the cup, all substantially as herein shown and described and for the purposes set forth.

80,924.—BELT BUCKLE.—William Cummings, Sacramento, California.

I claim, 1st, The points, provided with shoulders or rings near the end.

2d, The lever so arranged as to press said points through the belt and against the plate, substantially as set forth and described.

80,925.—CARPET STRETCHER.—S. G. Dare, New York city.

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I claim a carpet stretcher, having its teeth, a and b, and movable handle, c, arranged substantially as described, whereby it is caused to act upon the ender side of the carpet, substantially as herein described.

80,926.—VAPOR BURNER.—Dr. W. E. Darrah, Baltimore, Md.

I claim the burner, composed essentially of the parts, A A' and a', having the jets, c c, when constructed substantially as and for the purpose specified.

80,927.—CASING FOR RAILWAY-CAR STOVE.—S. L. Denney, Christiana, Pa. Antedated July 30, 1868.

I claim, 1st, the casing, A, provided with ribs, i i, in combination with a railroad-car stove, substantially for the purpose set forth.

2d, The combination of base, B, with casing, A, as and for the purpose described.

3d, The weighted arm or lever, h, operating in the manner and for the purpose specified.

80,928.—LATHE CHUCK.—J. S. Detrick. San Francisco, Cal.

I claim the back plate, D, constructed as described, in combination with the sliding chuck and adjusting screw, C, all substantially as set forth.

80,929.—SAW.—Charles Disston (assignor to Henry Disston), Philadelphia, Pa.

I claim a detachable saw tooth having a circular elastic base adapted to a circular recess in the blade, when there is on the edge of the said base or recess, and from the circular line which defines the same, such a projection or protuberance that the elastic base will yield on fitting the tooth to its base, all as herein set forth for the purpose specified.

80,930.—POWER CRANE.—W. F. Durfee, New Bedford, Mass.

I claim, 1st, The screw, B, with the nut, e', and pulleys, D D, attached, in connection with the chains, E E, and carriage, H, all arranged and applied to the crane, to operate in the manner substantially as and for the purposes set forth.

2d, The lever, F, in combination with the chains, E E, for the purpose of compensating for any inequality of tension between the two chains, as herein set forth and shown.

3d, The spirally grooved pulley, M, on the shaft, L, rope or chain, Q, and the shaft, L, operated by the screw gear, all arranged for moving the carriage, H, on the bars, b b, substantially as set forth.

4th, The bevel wheel, h, on the screw, B, and pinion, c', on shaft, A', arranged substantially as shown and described, for turning or adjusting the crane.

80,931.—DOOR SPRING.—Wright Duryea, Glen Cove, N. Y.

I claim, 1st, The combination, with the hinge proper, of the drum, H, chain or board, L, spindle, G, spring, J, worm wheel, I, and screw, K, for operation together, essentially as herein set forth.

2d, The arrangement, substantially as described, of the screw, K, relatively to the working mechanism of the hinge, and whereby the tension of the spring may be adjusted from the exterior of the jamb, as specified.

3d, In combination with a self-closing hinge, the swinging crane, M, arranged for operation by the chain and door, as described, and serving to give a more effective angle for the pull of the chain on the door, as herein set forth.

80,932.—SWITCHING APPARATUS FOR STREET RAILWAY CAR.

P. S. Duspuchet, New Orleans, La.

I claim the rocker arm, A, when provided with the radiating guide arm, B, and the weighted arm, B', in combination with the lever, C, and chains d e f, the whole being constructed, arranged, and operating conjointly, substantially as herein described for the purpose set forth.

80,933.—TWEER IRON.—C. F. Espick, Plymouth, assignor to himself and Joseph and John Stough, Marshall county, Ind.

I claim the arrangement of the screw, D, plate, C, and hinged bottom, E, with the tweer box, constructed and operating as set forth.

80,934.—SHOE FOR BATHING AND OTHER PURPOSES.—Louis Désiré Jeangeron-Ferry, Paris, France.

I claim, 1st, A shoe, constructed with a perforated sole, through which, on the bather emerging from the water, egress is provided for the water from the interior of the shoe, substantially as herein described.

2d, The metallic gauze, in combination with the perforated sole, substantially as and for the purpose herein specified.

80,935.—COAL STOVE.—G. F. Filley, St. Louis, Mo.

I claim forming the fire pot of a coal stove of two cones, B and D, having an opening or air streak, s, between their bases, for the admission of atmospheric air, when the same are arranged, constructed, and operated substantially as herein set forth.

80,936.—FIRE AND BURGLAR-PROOF SAFE.—Daniel Fitzgerald, New York city.

I claim, 1st, In the construction of safes for security, the employment of the corrugated case or cylinder.

2d, In combination therewith, the outer cylinder or case, as described.

3d, The inner cylinder or case, in longitudinal sections, in combination with a case or cylinder to surround the same and hold it in place.

4th, The inner cylinder or case in transverse sections, in combination with a suitable surrounding cylinder or case to hold said sections in place.

5th, The inserted metallic head, substantially as described.

6th, In combination with a corrugated case or cylinder, and the outer casing thereto, or the inner case, the filling in of the space formed under the arches of said corrugations and other interstices, with a fire-proofing material, substantially as set forth.

80,937.—MACHINE FOR TINNERS' USE.—W. Forshee and J.L. Judd, Marathon, N. Y.

We claim, 1st, Forming the knives or cutting parts P, of the die, N, in four or more pieces, separate from and adjustably secured to the body, N, of the die, substantially as herein shown and described and for the purpose set forth.

2d, Making the grooves, O, which receive the dies, N, adjustable, substantially as herein shown and described and for the purpose set forth.

3d, The combination and arrangement of the bed plate, A, standard, B, braces, C, curved horizontal guide, D, dies, L M and N P, rod, E, hooked lever, G, spring, K, connecting rod, I, and treadle or foot lever, J, with each other, substantially as herein shown and described and for the purpose set forth.

80,938.—APPLE CORER AND CUTTER.—A. Frost, Seymour, Indiana.

I claim, 1st, The slide, C, provided with rod, d head, G, and knives, e e, in combination with tube, b, in the center of the circular hole on the board, D all constructed substantially as described, for the purpose of cutting the core out of apples, as herein set forth.

2d, The combination and arrangement of the grooved bed piece, A, board, D, lever, H, slides, B and C, knives, a a and e e, and annular disk, F, all constructed as described and operating substantially as and for the purposes herein set forth.

80,939.—FLASK OR BOTTLE.—W. T. Fry, New York city.

I claim a covering for dram flasks, or other glass bottles, composed of papier-maché, or an analogous substance, or a textile or felted fabric, fitted on the flask or bottle, and coated with japan or other water-proof varnish, substantially as shown and described.

80,940.—MANUFACTURE OF CARBONATE AND OTHER SALTS OF SODA.—J. M. Gattman, New York city.

I claim the manufacture of chromate of soda and the carbonate of soda, by the process substantially as described.

80,941.—HOSE TENDER.—H. A. Gilbertson, New York city.

I claim a hose tender or carriage having coverings or protectors, b b, seats, c c c c, and brace, d, in substantially the manner described and shown and for the purposes set forth.

80,942.—DOVETAILING MACHINE.—R. E. J. Gould, Newark, N. J.

I claim, 1st, The within-described method of cutting dovetails by working from the bottoms of the grooves, or of the spaces between the tenons, consisting of the adjustable stops, e, in the slides of the upright gages, F J, or any equivalent means which will produce the same result.

2d, The adjustable stops, e, extending down into the grooves or spaces between the tenons, and secured in the slides, c, which are movable up and down on the upright gages, F J, substantially as and for the purpose set forth.

3d, The slotted bracket, h, in combination with the fulcrum pin, g, of the swinging abutment, 1', substantially as and for the purpose described.

4th, The combination of an abutment, I or 1', with an upright gage, F or J, movable in one direction, and provided with a slide, c, which is movable in a direction at right angles to the motion of the gage, substantially as and for the purpose set forth.

5th, The double-acting vertically-movable slides, c, in the upright gages, J J', substantially as and for the purpose described.

6th, The arrangement of two abutments, I I', extending across the carriage H, in different directions, and at angles which are supplements to each other, said abutments being provided with upright horizontally-adjustable gages, J J', and vertically-adjustable slides, c, substantially as and for the purpose set forth.

80,943.—MODE OF CANCELING POSTAGE AND REVENUE STAMPS.—Henry Greenfield, New York city.

I claim a postage or revenue stamp, prepared with acetate of lead, or other chemical, so that it can be canceled by the action of sulphate of ammonia, or other chemical, as a new article of manufacture.

Also, the within described process of canceling postage or revenue stamps simultaneously in quantities by exposing them to the action of fumes of sulphur, or of other chemicals in a gaseous form, substantially as set forth.

80,944.—BED BOTTOM.—Benj. Gregg, Bennington, Vt.

I claim the bed bottom formed of plate spring, c, attached to the frame, b, by the clamping pieces, d, and formed with the crotches or saddles, e, at their moving ends, receiving the slats, g g, as and for the purposes specified.

80,945.—LIQUID COOLER.—Emil Haass and M. A. F. Haass, Mendota, Ill.

We claim the trough, B, and pipe, B', constructed and arranged as described, in combination with fans, E' E', arranged as described, the whole being operated in the manner and for the purpose set forth.

80,946.—NUT MACHINE.—J. S. Hall, Pittsburgh, Pa.

I claim, 1st, The arrangement of the holing punch, F, cutting-out swaging punch, D, ram, C, and half toggles, R R T, with the weighted levers, V W, all constructed and operated substantially in the manner described.

2d, The arrangement of the perforated follower, i, matrix box, H, and holder, J, with slotted lever, M, and weighted crank lever, P Q, the whole constructed and operated as herein shown and described.

3d, The improved machine, as described and shown, for making nuts from hot bars of iron, in the manner specified.

80,947.—MACHINE FOR HANDLING HIDES.—John Hammond, Lattisburg, Ohio.

I claim the frame, C, provided with the rollers, a a, in combination with the cleats, B B, on the sides of a vat, for the purpose of easier handling the hides, substantially as herein set forth and described.

80,948.—LOOSE PULLEY.—D. Harrington, Worcester, assignor to himself and S. A. Woods, Boston, Mass.

I claim in combination with the bushing, b, and oil passages leading through it, and the surrounding oil chamber, c, the enlargement of such chamber from its ends toward its center, substantially as and for the purpose set forth.

Also, in combination with the enlarging chamber, c, the bridges, g, for keeping the oil toward the center of the chamber, substantially as shown and described.

Also, the flaring oil passages, d e f, substantially as shown and described.

Also, the collar, i, placed upon the shaft, and leading into chamber, c, substantially as shown and described.

80,949.—SPINNING MACHINE.—C. J. Harris, Warren, R. I.

I claim, 1st, A cylindrical flyer, a, with a thread-guiding arm, b, hinged thereto, constructed substantially as herein described.

2d, The arrangement of the flier, a b, constructed as described, with the spindle, A, to which it appertains so that the relation of the two shall remain unchanged by causing both to remain in fixed planes during the spinning operation and the winding up of the bobbin, substantially as herein set forth.

3d, The combination of the flier, a b, the independent traverse arm, d, the block, e, all constructed as described, with a suitably operated traverse rail, E, substantially as described.

80,950.—HORSE HAY FORK.—G. W. Heath, Burlington, Pa.

I claim the arrangement of the bars, A A, and their points, a a, bars, D D, pivoted as shown, and with points, b b, connecting bars, F F, and lever, E, all constructed and operating as set forth.

80,951.—TIN CAN.—G. E. Hegerman, Brooklyn, N. Y.

I claim so bending the edges of the plates that form the sides of a sheet-metal can, that there may be two rows, c d, of solder at the junction of every two adjoining plates, substantially as herein shown and described.

80,952.—MACHINE FOR SCARFING LEATHER.—C. H. Helms, Poughkeepsie, N. Y.

I claim the combination of the stationary horizontal cutter with the rollers, c and E, or either of them, having their edges or peripheries beveled obliquely to the edge of the cutter, substantially as hereinbefore described and for the purposes set forth.

80,953.—HEEL TRIMMER.—Charles H. Helms, Poughkeepsie, N. Y.

I claim, 1st, The spindle, F, in combination with the burr-cutter, G, a collar or shoulder of metal, J, at its base, substantially as hereinbefore described.

2d, The combination of the stand or frame, A, with the adjustable table board, D, and spindle, F, substantially as hereinbefore set forth.

3d, In combination with the adjustable table board, D, the stud or guide roller, K, substantially as hereinbefore set forth.

4th, The combination of the adjustable table board, D, with the burr cutter, G, and collar, J, substantially as hereinbefore set forth.

80,954.—MILLSTONE MACHINE.—E. C. Henderson and R. A. Henderson, Albia, Iowa.

We claim, 1st, The sliding bearing blocks, B, operated by means of the rack and pinion, I I, for giving to the pick of a millstone-dressing machine a horizontal motion, substantially as shown and described

2d, The shafts, C D, connected by gearing, K L, and provided with the pinions, I, and eccentric, O, when said shafts have their bearings in the sliding blocks, B, and are arranged with relation to the rack, J, and frame, A, substantially as herein described.

3d, The pick lever, E, when fitted at one end to turn upon the shaft, C, and and formed with an elongated eye, P, adapted to receive the eccentric, O, on shaft, D, said lever being arranged to be operated both vertically and horizontally within the frame, A, in the manner and by the means herein shown and described.

80,955.—MEAT CHOPPER.—J. G. Hirzel, Wilmington, Del.

I claim the combination of any convenient number of knives or blades with the intermittent rotary knife block, h, the block k, its toothed rotating metallic rim, l, and arm or wing, m, and the pawls, n and o, and guide, all arranged and operating as described.

80,956.—STEAM GENERATOR.—T. Holt, Trieste, Austria. Patented in England June, 10, 1867.

I claim, 1st, The combination of the inclined flues, E, dividing plate, E, and the removable diaphragm, I, in the marine boiler, as herein described for the purpose specified.

2d, The combination of the flattened tube, E, composed of metallic plates, having expanded ends and braced internally by the balls or bars, said tubes being riveted together at their ends to leave water passages between their adjacent sides, as herein described for the purpose specified.

08,957.—WATER ELEVATOR.—J. G. C. Horton, Gillespie, Ill.

I claim, 1st, The endless chain of buckets, A a', and the stationary crab, B, when combined and arranged as described and for the purpose set forth.

2d, The crab, B, when provided with short legs, b, and side apertures, b', and otherwise constructed and arranged as described and shown.

80,958.—SCROLL-SAWING MACHINE.—W. W. Hubbard, Manchester, N. H.

I claim, 1st, The double yoke, A B, supporting the slide, C, operating in combination with the boxes, K K.

2d, The mode of adjusting the trusses, J J, by means of bearings, E E, or their equivalent, in combination with the hollow beams, D D, substantially as and for the purpose set forth.

80,959.—KEY-HOLE GUARD.—Alfred Huffnagle, Philadelphia, Pa.

I claim, 1st, The escutcheous, E and F, stud, C, and spring, D, when constructed and used in the manner and for the purpose substantially as herein set forth.

2d, The manner of retaining the key in the lock by the escutcheon, E, fitting into a groove in the shank of the key, against which it is pressed by a spring, substantially as herein specified.

80,960.—PROPELLER.—Robert Hunter, New York city.

I claim the oscillating lever, g, adapted to be turned upon its axis for reversing, in combination with a pivot float propeller, substantially as and for the purpose stated.

80,961.—GUIDE AND MARKER FOR SEWING MACHINE.—E. W. Ingle, New Orleans, La.

I claim, 1st, The rock shaft, D, when constructed substantially as described, and provided with a spring, c, in combination with the slotted arm, C, when constructed and operating as set forth for the purpose described.

2d, The combination of the plate, A, with the roller, B, spring, m and n, guide plate, E, rock shaft, D, arm, C, and edge, s, when these several parts are constructed and conjointly operate substantially as herein described for the purpose set forth.

80,962.—FENCE POST DRIVER.—J. D. Israel, Utica, Iowa.

I claim the combination of the tripod, the hammer, the rope, the sleeve, the hand wheel, and the lever, constructed and arranged substantially as described.

80,963.—VENTILATING HAT.—Thomas Richard Johnson, Montreal, Canada.

I claim a hat formed in three sections, B, C, E, and F, with their fastenings, D, and apertures, G, H, and J, combined and arranged as herein described, and for the purposes set forth.

80,964.—CAR BRAKE AND STARTER.—William J. Johnson, New Orleans, La.

I claim the combination of the angular lever, h i, the elastic metallic band, j, the hinged block, k, and the counter spring, l, with each other and with the car axle pulley, g, substantially in the manner and for the purposes herein set forth.

80,965.—KNITTING MACHINE.—George Johnstone, Philadelphia, Pa.—Antedated August 1, 1868.

I claim, 1st, In a circular knitting machine, a series of bearded needles, arranged and operating in conjunction with a series of fingers, substantially as and for the purpose described.

2d, Fingers, substantially such as described, hung to sections admitting of separate and independent movements in the arc of a circle, substantially as set forth for the purpose specified.

3d, Fingers, substantially such as described, projecting from or forming a part of jacks, to which movements may be imparted by the devices herein described, or any equivalent to the same, that some of the needles may be covered by the fingers to a greater extent than others, for the purpose set forth.

4th, The adjustable jacks, in combination with the guide bars, C8 C9, the plate, C, and the slides, 12 13, or equivalent devices, whereby the jacks may be brought under the control of one or other of the said bars, the whole being constructed and operating substantially as and for the purpose described.

5th, The combination of jacks, a bar or plate, C7, and the slides, I I1, or their equivalents.

6th, Jacks, substantially such as described, in combination with a jacquard apparatus, pattern chain, or pattern wheel by which the jacks are controlled through the medium of the devices herein described, or any equivalent to the same.

7th, The sections, E, with their jacks, in combination with a jacquard apparatus, pattern wheel, or chain operating on the said sections through the medium of the levers, F, and adjustable rollers, p p1 p2, or their equivalents.

8th, A presser wheel, having movable plates, secured to or forming a part of the same, so that the said plates may be controlled in the manner and for the purpose described.

9th, The fingers, r, operating in combination with needles of different lengths, substantially as described and for the purpose set forth.

80,966.—SIEVE.—Mrs. J. D. Jones, Jersey City, N. Y.

I claim, 1st, The dish or pan, A, or equivalent vessel, hoop, B, annular plate, C, flanged cylindrical vessel, D, wire cloth, E, and detachable hoop, F, having cross bars, G, attached to it, in combination with each other, said parts being constructed and arranged substantially as herein shown and described, and for the purposes set forth.

2d, The presser and scrapers, I J K L M, constructed substantially as herein shown and described, in combination with the devices, A B C D E F G, as and for the purposes set forth.

80,967.—BALE LABEL.—Norman C. Jones, New York city, N. Y.

I claim the metallic tag, A, when constructed and used substantially as and for the purposes herein shown and described.

80,968.—HOISTING GEAR.—W. O. Jones, Portland, Me.

I claim, 1st, The combination of the geared wheel, f, with the gears, c and e, having shafts, k and m, on the face plate, F, and when the clutch, h, is inserted at the recesses in j, substantially as and for the purposes set forth

2d, The combination of the clutch, h i, on shaft, C, with the gears, a b c d e, and gear, f, and for the purpose set forth.

3d, The combinations of the small gears, a b c d e, both fixed and free, when serving in connection with f, not only as levers to revolve the face plate, F, as is the case with the gears having shafts, but also as friction rollers for the shaft, C, substantially as herein set forth.

80,969.—GATE.—Munson F. Kent, West Union, Iowa.

I claim, 1st, The vertical slats, a, connected by the chain, h, to the post, C, all constructed, arranged, and operating substantially as and for the purposes herein set forth.

2d, The gate post, A, in combination with axle, F and cord K, by means of which said gate is raised, substantially as shown and described, and for the purposes set forth.

3d, The vertical post, C, in combination with the cord, a' and weight w, by means of which said gate is opened, substantially as shown and described, and for the purposes set forth.

80,970.—FANNING AND ROCKING CHAIR.—Thomas Kerr, York, Pa.

I claim the combination of the platform, A A A A, the projecting pins, n n n, the upright, O O, with lever, B B, straps, H H, strap, F F, pulley, B, shaft, C C, and fan, A A, as described

80,971.—COMBINED FOOT REST, GRATE, AND FIRE BRICK BASE.—John H. Keyser, New York city.

I claim, 1st, Constructing a circular flange or foot rest for a stove, with a receptacle for a fire brick lining, substantially as described.

2d, Constructing a circular flange or foot rest for a stove with grate bearings, substantially as described.

3d, The combination of flange, A, collars, c d g, and depressions, a a', substantially as and for the purposes described.

80,972.—DOOR PANEL.—L. W. Kimball, Pittsford, Vt.

I claim the panel, A, constructed with side pieces b and chambers B, with braces, arranged substantially as and for the purpose described.

80,673.—WAGON LOCK.—Francis A. Kington, Mendon, Ill.

I claim a brake for wagons, adapted for operation by an operator on a high road, and having lever, G, block, H, racket, K, staple, S, and posts, O O, constructed, arranged, and operating substantially as specified.

80,974.—REVERSIBLE LATCH.—Jacob Kinzer, Pittsburg, Pa.

I claim constructing the plate, A, of a reversible lock in two pieces, in the manner shown and described, and operating in combination with the latch bolt, C and spring bolt B, which latter is confined in the lower part of the casing of the lock, in the manner shown and for the purpose set forth.

80,975.—SCREEN FOR MACHINES FOR TREATING COTTON.—Richard Kitson, Lowell, Mass.

I claim a wire screen cylinder, constructed as described, with wires soldered together at their crossings and at their abutting ends, and the ends of the screen soldered to the heads or ends of the cylinder.

80,976.—BRICK MACHINE.—J. A. Lafler, Albion, N. Y.

I claim, 1st, The self-releasing crank, j, for operating the swinging press H, substantially in the manner and for the purpose set forth.

2d, The method of securing the scrapers and knives, S S, in the shaft E, namely, the hooked tangs, v, in connection with keys, t, and mortised hollow shaft, E, substantially as and for the purpose set forth.

3d, The combination of the swinging press frame, H, telescopic press box, F A, slide, B, and driving devices, d D C C, working from the foot of the grind shaft, E, all constructed and operating in the manner shown and for the purpose described.

80,977.—BRICK PRESS.—W. O. Leslie, Philadelphia, Pa.

I claim, 1st, The tilting rack, I, constructed and arranged to operate substantially as described.

2d, The combination of the stationary plate, C, sliding table, B, with the mechanism for operating the same, and the cams, G and H, when arranged for joint operation, substantially as set forth.

80,978.—SPIDER.—Nelson Lewis, Troy, N. Y.

I claim, 1st, The employment of the hinged joint, D, containing the stops, E, the same being constructed and arranged upon the said spider, A and cover B respectively, and so combined as to allow or permit the said cover to swing or turn upon the upper edge of said spider, in the manner substantially as herein described and set forth.

2d, The damper or ventilator, c, in combination with the snider, A, and cover or lid B, substantially as and for the purposes herein described and set forth.

80,979.—TREMOLO.—La Fayette Louis, Boston, Mass.

I claim, 1st, In combination with a wind actuated wheel, for driving a tremolo valve or wheel, a finger, or equivalent mechanism, for starting the wheel, substantially as described.

2d, The employment of a finger, or equivalent device, for arresting the motion of the valve driving wheel, and for holding it stationary, substantially as described.

3d, The valve and wheel containing cylinder, having a wind pipe and valve openings, arranged substantially as described.

4th, Combining with the wind pipe, x, a screw or other device for contracting the pipe, substantially as set forth.

5th, In combination with the wind wheel, t, and valve containing case, o, the wings or guards, c2, arranged to operate suostantially as and for the purpose described.

6th, In combination with the wind chest and main and tremolo valve passages, the auxiliary air passage, l, substantially as described.

80,980.—HYDROCARBON BURNER.—David H. Lowe, Boston, Mass.

I claim the within described apparatus, for producing gas for illuminating purposes, substantially as set forth.

Also, the combination of a lamp burner with the reservoir, D, for containing the naphtha or gasoline, substantially as described.

80,981.—APPARATUS FOR TANNING LEATHER.—Hiram Lucas, Rowsburg, Ohio.

I claim the adjustable rack frame, B, and cleats or bearings, I, upon which the frame is pivoted when in operation, in combination with the vat, the said frame being raised or lowered with its load of skins by means of the windlass, substantially as and for the purpose set forth.

80,982.—LOOM.—James Lyall, New York city.

I claim, 1st, A vibrating lay and a reciprocating shuttle, adapted to passing, either end first, between the warps, in combination with a carrier, provided with actuating rollers that are moved across the vibrating lay on the other side of the warps, and to which an independent rotary motion is communicated in the same direction that the rollers would be rotated by contact with the warps substantially as for the purposes specified.

2d, In combination with the reciprocating shuttle and lay, a shuttle driver, provided with rollers, substantially as described, so that the rollers that come in contact with the warps are rotated by contact with the rollers that supported the shuttle driver, substantially as set forth.

3d, The reed and lay, have a raceway, l, and a shuttle rail, w, substantially as set forth, in combination with the reciprocating shuttle driver and the shuttle that is actuated by said driver, substantially as set forth

4th, A vibrating lay, in combination with a reciprocating shuttle, and a shuttle driver, that operates upon the shuttle during its entire reciprocation, the warps intervening, substantially as set forth.

5th, Two or more moving pulleys, combined with the said shuttle driver and connection to the same, substantially as set forth, so as to multiply the movement in operating on the shuttle driver, as specified.

6th, The cams, operating substantially as specified, to stop and start the shuttle gradually, and operate while the lay is stationary, in combination with the cams for operating the lay while the shuttle is stationary, substantially as set forth.

7th, The cam, w', formed of a flange, in combination with the two rollers that are connected with the lay, one of which is yielding, and between which said flange moves, substantially as set forth.

8th, The shuttle driver, substantially as specified, in combination with cords, or their equivalents, that pass off on opposite sides, and are connected to the actuating mechanism at or near the line of the axis or fulcrum of the lay, substantially as specified.

80,983.—DOOR BELL.—Thomas Lyons, Hartford, Conn.

I claim the arm, g, in combination with the inclined elevation, i' on head, i, and hammers, d, arranged and operating substantially as and for the purpose described.

80,984.—LAMP BURNER.—L. J. Marcy, Newport, R. I.

I claim, 1st, The arched perforated plate, b, arranged between the wick tubes, whereby the upward current of air from the chamber, B, is broken, to prevent the formation of eddies when it encounters the lateral current which enters through the perforations in the upper chamber, A, as herein shown and described.

2d, The cap or cone, C, when formed with two abrupt lateral shoulders, g g, substantially as described, and for the purpose set forth.

80,985.—BREECH-LOADING FIRE-ARM.—James E. McBeth, New Orleans, La.

I claim, 1st, The bolts, C C, center piece, D, and spring, E, in combination with the projections, d and e, and spring, H, for the purpose of opening the breech by the half-cocking of the piece, substantially as and for the purposes herein set forth and described.

2d, The elongated slots, k k, and holes, l l, in combination with the pivots, i i, and spring bolt, m, for the purpose of removing the lock box from the piece, and preventing it from falling out at random, substantially as herein set forth.

3d, The cartridge ejector, J, constructed as described, in combination with the cam, o, on the front pivot, i, for the purpose of ejecting the shell of the old cartridge, substantially as herein set forth and described.

80,986.—FILE-FASTENER.—E. P. McCeney, Washington, D. C.

I claim hinging a handle to the lever of a file-fastener, substantially in the manner and for the purpose herein described.

80,987.—CAMP-STOVE AND OVEN.—D. C. McNeill, De Witt, Iowa. Antedated August 1, 1868.

I claim, 1st, The folding stove, when its sides are hinged together at the angles by the vertical rods, C extending below the stove, at a, for the purpose of being inserted into the ground, whereby the ground is made to form the bottom of the stove, upon which the fire is built, as herein shown and described.

2d, In combination with the folding stove, having the open bottom, the chimney L, when composed of sections hinged together, and adapted to fold down upon the top plate, G, as herein shown and described.

3d, The radiating oven, F, constructed as described, its top and sides hinged together at the angles, and secured to the back, H, and to the back plate of the stove, by the extended pintles of the hinges, C' c, as herein described, for the purpose specified.

80,988.—CORSET, ABDOMINAL, AND SKIRT SUPPORTER.—John McNeven, New York city.

I claim the corset and skirt supporter, constructed as described, of the sections, A B C D, cut out upon the hips, and extended in front to completely cover the abdomen, and the stiffened section, E, removably attached at its ends to the extended portion of the section next the hips, substantially as described, for the purpose specified.

80,989.—SPRING AND DUSTER FOR WATCH.—John H. Morse, Peoria, Ill.

I claim the metal case, D, with its steel spring, F, to be used as a "lift spring" and "duster" for watch cases, in the manner and for the purpose specified,

80,990.—CASTER FOR FURNITURE.—Hezekiah Munroe (assignor to Albert F. Munroe), Fall River, Mass.

I claim the arrangement in the horizontal recess formed in the side of the spindle, B, of the horizontal friction roll, C, bearing against the inner surface of the chamber, g, formed at the lower end of the case, E, said spindle being held within the case by the flange, e, and shoulder, f, all constructed as described, for the purpose specified.

80,991.—TAILOR'S SEAT.—Friedrich Neuhaus, Belleville, Ill.

I claim 1st, The combination of the leg cushion, F, with the bar, E, socket, e, rod, D, pipe, G, socket, c, and spring, H, all made and operating substantially as herein shown and described, for the purpose of making the said cushion at once elastic and adjustable.

2d, The combination of the seat, A, and hinged seat back, B, with the spring, j, arm, g, and gage screw, l, all operating substantially as herein shown and described.

80,992.—ROAD GATE.—E. Nicholson, Rockport, Ohio.

I claim pivoting the gate at a, and to the arm, G, in combination with the shaft, F, and arm, E, operated by means of the starting bars and rods, as and for the purpose set forth.

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80,993.—MACHINE FOR CUTTING RASPS.—William T. Nicholson, Providence, R. I.

I claim 1st. In combination with a file bed and cutter, the eccentric, irregular-surfaced rotating pattern shaft, G, operating through any proper devices for maintaining the file bed or cutter in contact with such pattern shaft, to govern the movements of the former, substantially as described.

2d, The combination of the disk plate, O, with the mechanism for giving movement to the file bed in the direction of its length, substantially in the manner described, whereby the character of the lines in which the teeth shall stand across the face of the rack may be determined.

3d, The combination and arrangement of the eccentric rotating pattern shaft, G, the file bed, F, and the yielding straight edged bar, L, substantially as described, for the purpose specified.

80,994.—BEAN PULLER.—S. R. Niles, Rawsonville, Mich.

I claim the combination of the shafts, B B, shear cutters, A, having fingers, a a a, etc., and the adjustable frame, D C 1, all operating substantially as shown and described, and for the purpose set forth.

80,995.—WASH BOILER.—Andrew O'Neill, Portsmouth, O.

I claim the removable inner boiler, B, provided with a packing or gasket, C, and adapted for application to an outer boiler of common construction, to constitute an automatic wash boiler, as explained.

80,996.—FLUID METER.—Webster Park, Norwich, Conn.

I claim, 1st, The combination and arrangement, in a fluid meter, of two or more loose pistons, resting on their respective valves, with their rods connected by the chain, l, and the pulley, R, or their equivalents, and the spring, n, or its equivalent, all arranged and operated within the cylinder, A, and so placed that all may be removed together, substantially as set forth.

2d, The double-acting spring, n, fig. 8, in connection with the channel, E, or their equivalents, constructed for operating the valve rods and indicator of a fluid meter, substantially as herein set forth.

3d, The combination of two or more piston rods of a fluid meter, rotating together, also acting as valve rods, with their valves, the guide with the groove, in which it traverses, and the spring or springs, or their equivalents, constructed and operating substantially as and for the purposes herein set forth.

4th, The arrangement of the arm, p, of the piston-rod, in connection with the spur, or ratchet wheel, for moving suitably registering mechanism, substantially as and for the purposes herein set forth.

80,997.—CLAMP NUT.—William Pearson, Windsor Locks, Conn.

I claim the eccentric mutilated nut, C, and eccentric bearing, in combination with a screw, substantially as herein described.

80,998.—BOLT HOLDER.—George W. Phelps, Conneaut, O.

I claim the bolt-holder, consisting of the lever, A, wedge, b', button, c, lever, D, bar, D', and bar, E, constructed and arranged as herein described.

80,999.—METHOD OF FORMING STOCKINGS.—Elam O. Potter, Chicopee, Mass.

I claim, as an article of manufacture, a stocking formed substantially as described, and having the side seams, m c e, machine sewed, substantially as described.

81,000.—MECHANICAL TYPOGRAHER.—John Pratt, Greenville, Ala.

I claim, 1st, The oscillating rods, H I, constructed and operating substantially as and for the purpose set forth.

2d, The adjusting screws, x, substantially as arranged, and for the purpose set forth.

3d, The rod, G the bell-crank lever, K, links o n, and india-rubber joints, p constructed, arranged, and operating substantially as described.

4th, The rod, g1, and oscillating rod, M, tongue, g3, and spring, d3, constructed, operated, and arranged substantially as and for the purpose set forth.

5th, The rod, R, escapement wheel, T, crutch, U, link, c2, and arm, d2, rod, M, and pulley, S, arranged and constructed substantially as and for the purpose described.

6th, The pinion, o, lever, a2, and attached curved rack, b2 spring, u1, bell crank lever, r2, and rod, q2, frame, P, and clamp, o, constructed, arranged, combined, and operating substantially as and for the purpose set forth.

7th, The frame, Q, sliding in grooves, m3, rack, v2, the lever, t2, link rod, s2, pawl, n2, and lever, W, constructed, arranged, and operating substantially as and for the purpose set forth.

8th, The lever, k2, spring, n2, link, j2, bell-crank lever, X, link, i2, arm, h3, and lever, W, or their equivalents, arranged, combined, and operating substantially as described.

81,001.—FURNITURE CASTER.—Seymour Clesson Pratt, Boston, Mass.

I claim, in combination with the ball-containing socket piece, a, the glass-bearing ring, c, against which the side of the caster ball rotates, substantially as described.

Also, in combination with such socket ring and ball, the minor socket and ball, h 1, arranged substantially as shown and described.

81,002.—JOURNAL BOX.—H. M. Preston, Unionville, Conn.

I claim the combination of the boxes, c' c' c, wedges d d, or their mechanical equivalent, head, a, and tightening screws, substantially as and for the purpose described.

81,003.—HORSE RAKE.—Wm. Read, Vernon, Ind.

I claim, 1st, The device for releasing the teeth, k k, composed of the draw springs, n, or its equivalent, operating in connection with the lever frame c escribed, or other device, all arranged substantially as described, and for purpose set forth.

2d, The arrangement of the springs, G G, with suitable catches, and wipes, m m, together with the backing and sustaining springs g g, for the purpose of preventing a back revolution of the rake when operating, substantially in the manner as described.

81,004.—ICE ELEVATOR.—William T. B. Reed, Chicago, Ill.

I claim the combination and arrangement, substantially as shown and described, of the endless chain, G, the pulleys, E, (with their guards, F,) hooks, J, and frame, A, substantially as and for the purposes set forth.

81,005.—LOOM-ACTUATING SHUTTLE BOX.—Michael Rice, Upland, Pa.

I claim the shuttle-box actuating mechanism, combined and arranged substantially as herein shown and described.

81,006.—PRESSURE INDICATOR.—F. T. Riegel, Philadelphia, Pa.

I claim, 1st, The chamber, B, the valve-seat tube, D, the conical valve, C, cone, g, and screw, F, constructed and arranged substantially as described, for the purpose set forth.

2d, The yoke, E, the screw, h, and the weighted screw hook, J, in combination with the chamber and valve, as above mentioned, substantially as and for the purposes described.

81,007.—MACHINE FOR MILLING THE KNIFE EDGES OF SCALES.—Thomas J. Rockwood St. Johnsbury, Vt.

I claim, 1st, The combination of the table and holding device with the four milling tools, P P2 P P2, when all are adjustable as herein set forth.

2d, The laterally-adjustable cross piece, F, the knife-edge supports, f, adjustable to a greater or less distance apart by means of the screws, f', and the table, D, in combination with the milling tools, P P2, all arranged substantially as and for the purposes herein specified.

3d, The adjustable vertical stop, X, and screw shaft, x, in combination with the levers, C C, carriage, B, table, D, and the milling tools, P P2, as and for the purposes herein set forth.

4th, The gauges, N, their holders, L, and fixed knife edges, V, on the carriage, B, and table, D, in combination with the milling tools, or their equivalents, as and for the purposes herein set forth.

5d, The arrangement of the milling tools, P P2 P P2, the carriage, B, the table, D, and the several devices connected therewith, so as to allow the confining of levers of different sizes, and of different proportions and widths, and the ready changing of the levers and of all the several parts, substantially in the manner herein described.

81,008.—EYE WATER.—J. Roemheld, Chicago, Ill.

I claim a medical compound, consisting of the ingredients in about the proportions set forth.

81,009.—ROTARY BLOWER.—P. H. Roots and F. M. Roots, Connersville, Ind.

We claim, 1st, The co-operating abutments, A B, constructed with skeleton pistons, having their external circular peripheries connected by longitudinal arms to the center cylinders, as and for the purpose specified.

2d, The abutments, A B, having their center cylinders made of plaster of Paris, or other plastic or molten material, substantially as and for the purpose set forth.

3d, The abutments, A B, having the arcs of their pistons so constructed as to become simultaneously disconnected from their respective cylinders at certain portions of their revolutions, as herein described.

80,010.—CASE FOR ROTARY PUMPS.—P. H. Roots and F. M. Roots, Connersville, Ind.

We claim, 1st, A rotary blower case, the interior of which is rendered true and accurate by means of plastic or molten materials, substantially as set forth.

2d, A rotary blower, the end sor heads of which are rendered true and accurate by means of plastic or molten materials, substantially as herein shown and specified.

3d, A rotary blower, the concave or arcs of circles of which, and the ends or heads of which are rendered true and accurate by the use plaster of Paris, or other plastic material, or of molten metal, as described.

81,011.—TRY SQUARE.—William Ross, Paducah, Ky.

I claim the plate, C, having the slot, E, when held to the fixed blade by means of a clamping screw, I, passing through the transverse slot, E, and the longitudinal slot, D, whereby the plate, C, is made adjustable, both longitudinally and vertically, and is rendered equally useful in dressing lumber, either to a level or bevel, as herein shown and described and for the purpose specified.

81,012.—STRINGED MUSICAL INSTRUMENT.—Gustav Schleicher, Mount Vernon, N. Y.

I claim, 1st, The tongue, B, attached to the lower or inner surface of the sounding board, A, substantially as and for the purpose set forth.

2d, The arrangement of ribs, f g h, at the under surface of the sounding board, A, in combination with the bridges, a b, and tongue, B, substantially as and for the purpose described.

81,013.—APPARATUS FOR RAISING WATER.—Herman Schlotter, Kostriz, near Gera, Germany.

I claim the combination, substantially as shown and described, of tubes, D D', in any desired number with the rocking beams, C, in such manner, or so arranged in relation thereto, as to produce a counter balancing action or effect, said tubes being fitted with upper valves and operating, when immersed at their lower ends, and reciprocating as described, to elevate water or other liquid, as herein set forth.

81,014.—SHOE LAST.—Justin Schmitt, New Albany, Ind.

I claim the combination of the part, B, with the last, A, when said last is provided with the screws, x x on its under side, and with the plates, C C, all constructed and used substantially as and for the purposes set forth.

81,015.—WATER METER.—Louis Sexauer, New York city.

I claim, 1st, The diaphragm or supplementary piston, t, communicating with the supply pipe, D, and with the valve chamber, in combination with the toggle arms, n 1, piston rod, B, slide, and valve, F, substantially as and for the purpose described.

2d, The stops, a' b', on the piston rod, in combination with the projection, c', on the slide, e, substantially as and for the purpose set forth.

3d, Giving the piston a dead motion on its rod, so as to gain time for the projection, c', to clear the stops, a' b', as set forth.

4th, The stops, d', on the piston rod, in combination with the projection, e', and platform, i, substantially as and for the purpose described.

81,016.—APPARATUS FOR DAMPENING GRAIN.—I. Shellabarger, Decatur, Ill.

I claim the spout, A, having inclines, B B, arranged as shown when the same is in combination with the steam chamber or pipe, and is used for conveying grain from the pipe, E, or its equivalent, to the grinding apparatus, substantially as described and for the purpose specified.

81,017.—FARM GATE—Henry S. Shisler, Manheim township, Pa.

I claim the self acting drop bar, B, connecting lever, C, to the latch bolt, D, in combination with the sliding wedge bar, G, operated by the diagonal bar, F, and the movable clamp, E, all arranged and operating in the manner and for the purpose specified.

80,018.—COTTON BALE TIE.—J. A. Shone, Holly Springs, Miss.

I claim the bale tie, formed upon the band, A, by notching one of its ends upon the under side at c, and passing the same through a diagonal slot, e, formed in the folded opposite end, as herein shown and described.

81,019.—CURTAIN FIXTURE.—John Shorey, Lowell, Mass.

I claim, 1st, The adjustable bearing, 2, with the projecting figure for holding the end of the roller, as shown in figs. 1 and 2, in connection with the bracket, B, as shown in fig. 2, as shown and described, as and for the purposes set forth.

2d, The pulley, e, with the rubber packing, 3, in connection with the friction pulley, 5, when made and operated substantially as and for the purposes set forth and described.

3d, The combination of the roller, slotted at 6 and 8, and wedge, 9, for the purpose of fastening the curtain to the roller, as and for the purposes set forth and described.

81,020.—TOBACCO PIPE.—Olaus Sjoberg, Chicago, Ill.

I claim, 1st, The combination and arrangement of the elongated cap, A, provided with a passage, a, and perforated plate, b, with the tobacco chamber, D, so that the pipe may operate, when inverted, substantially as specified.

2d, The combination and arrangement of the chamber, D, provided with the tube, c, projecting into the enlarged stem or section, C, with the passage E, annular oil chamber, d, substantially as specified.

3d, The combination and arrangement of the sections, A B C, plates, b and b, and perforated tube, c, with the stem, f, and mouth-piece, g, substantially as specified.

81,021.—MACHINE FOR CUTTING PAPER.—Henry Skidmore, Mount Vernon, N. Y.

I claim, 1st, The combination of an oblique or helically shaped revolving cutter with a stationary knife, when both are so suspended or carried in an adjustable frame as that their angular position, relatively to the path traveled by the said material between them, may be varied, substantially as and for the purpose or purposes specified.

2d, The combination, with a constant or continuous feed to the strip or material in sheet form to be cut, as established by drawing rollers or their equivalents, of a continuously revolving cutter, acting in concert with a stationary knife, essentially as herein set forth.

3d, The knife, J, beveled, as shown and described, on its cutting edge, relatively to the passage of the material over or against it, for operation, in combination with a traveling or rotary cutter, substantially as specified.

4th, The knives or cutters, I and J', when beveled on their cutting edges relatively to each other, and to the travel or passage of the material to be cut, essentially as shown and described.

5th, In combination with a rotary cutter, a stationary knife or cutter, adjustable towards or from it, and pressed forwards by a spring, or its equivalent so as to slightly project into the path traveled by the advanced edge of the rotary cutter, and so that said stationary cutter is pressed or urged backwards by the rotary one in passing it, as specified.

6th, The arrangement of the cutters, I J, intermediately between the drawing rollers, C, and the delivering rollers, F, for operation, substantially as specified.

7th, The combination of the feed rollers, C D, delivery rollers, F G, and cutters, I J, whereby paper, cloth, foil, or other like material may be fed in a continuous manner, and cut up into sheets at right or other required angles, to or across the feed or edges of the strip, all being arranged and operating essentially as specified.

81,022.—SADDLE TREE.—J. S. Smelser, Williamsburg, Ind.

I claim the combination of the bulged frame, b, upright, e, and plate, t, with frame, c, and bow, a, when constructed as described.

81,023.—ANIMAL TRAP.—Oscar R. Smith, Elgin, Minn.

I claim, 1st, The combination of the spring, S, with the frames, F F', the catch, P, the trigger, D, and the jaws, O O', all arranged to operate substantially in the manner set forth.

2d, The semicircular shape of the jaws, O O', whereby they fit the burrow of an animal when the trap is set.

81,024.—VALVE FOR WATER CLOSET.—W. Smith, San Francisco, Cal.

I claim, 1st, The tube, D, applied to the face of a self-suspending water closet valve, with water way at its base, substantially as shown and described, for the purpose specified.

2d, In combination with the tube, D, the spindle, E, with the disk and packing, h, and the packing, L, compressed by the spring, B, substantially as shown, and for the purposes set forth.

81,025.—PAD FOR HORSES HOOFS.—H. W. Southworth, Mittineague, Mass.

I claim the raw hide cushion for horses' shoes, constructed substantially as herein described, and for the purposes specified.

81,026.—SNAP HOOK.—Wm. E. Sparks, New Haven, Conn.

I claim the arrangement of a divided tongue in two parts, a and d, pivoted so that each may turn independent of the other, and so that one opens outward, and the other inward, each bearing upon the end of the hook, A, and provided, respectively, with projections, h and l, or other equivalent means, for operating substantially in the manner and for the purpose herein set forth.

81,027.—GAGE COCK.—Francis Stebbins, Hinsdale, N. H.

I claim the combination of the shell, S, packing, P P', perforated sleeve, D, and packing nut, B, with the cylindrical piston, A, having ports, G G', and steam passage, C, formed therein, the whole arranged and operating substantially as described.

81,028.—RAILWAY SWITCH.—Wm. J. Stowell, Baltimore, Md.

I claim, 1st, Employing, in combination with a continuous rail track, B, and and a sliding, C, a laterally vibrating inclined and curved guard rail, C1, and an inclined switch section, C2, constructed and arranged to operate substantially as described.

2d, The guard rail, D, with curved extremities, connected by jointed levers and rods to the rail sections, C1 C2, substantially as described.

81,029.—RAILWAY SWITCH.—Wm. J. Stowell, Baltimore, Md.

I claim, 1st, The combination of vibrating switch rails, B1 B2, of the siding with the vibrating switch rail, A1, forming part of the main track, said rail sections being arranged and connected together substantially as and for the purposes described.

2d, The auxiliary lever, E, with its fastening, j, applied to the standard, C, of the switch lever, D, substantially as and for the purposes described.

81,030.—LOCK NUT.—Wm. J. Stowell, Baltimore, Md.

I claim the locking plate, g, having plane surfaces, in combination with a grooved seat, c, both constructed substantially as described, and serving the purpose of fastening nuts upon bolts, as set forth.

81,031.—BIT STOCK.—O. G. Stratton, Greenfield, Mass.

I claim, 1st, The combination and arrangement of the yoke or thumb piece F F', shaft, G, cam, C, pivot, g, and recessed and slotted lever, A, with a bit brace or stock, substantially as and for the purpose described.

2d, A conical shank, s, of a bit or other tool used in a bit stock, having a recess, k', therein, to receive a feather or projection in the socket, in combination with a socket in the bit stock, which is conical in longitudinal section, as described.

81,032.—STENCIL PLATE.—E. L. Tarbox, Nashville, Tenn.

I claim the plate, B, the shield, C, and the handle, A, constructed and arranged with regard to the letters and figures, and to each other, substantially as and for the purpose described.

81,033.—ARTIFICIAL LEG.—Louis Tassius, Norwalk, Ohio.

I claim the herein described artificial leg, consisting of the heel plate, K, stirrup, P, springs, H L, links Q R, and sling, A, all constructed and arranged to operate in combination with the articulated foot, T, and leg, T', in the manner substantially as set forth.

81,034.—HAND CULTIVATOR.—Barnett Taylor, Forestville, Minn.

I claim the combination of the cutters, H, stationary upright, I, pivoted uprights, J, block, D, adjustable block or bar, E, supporting bar, F, shovel plow, M N, and wedge, L, with each other and with the slotted beam, A, and wheel, B, substantially as herein shown and described and for the purpose set forth.

81,035.—SAW FILING MACHINE.—Joseph Temple, Terre Haute, Ind.

I claim the arrangement of the oed plate, A, saddle piece, B, and frame, C, in combination with the file holder in which the file is placed, when all the parts are constructed and operated in the manner and by the means described, so as to be adjustable for the purpose of giving any depth or pitch to the teeth of a saw that may be desired, substantially as herein set forth.

81,036.—PRIMING FOR NEEDLE GUNS.—Chas. H. F. Thieme, North, Vernon, Ind.

I claim an explosive or igniting composition, having hyposulphite of any metal as a base, substantially as set forth.

81,037.—ASH SCREEN AND COAL HOD COMBINED.—Thos. J. Thurston, Lewiston, Me.

I claim the combination with the bod, A, having the hole, c, slot, d, and staple, k, of the sifter, B, having the crank shaft, a, the combination to operate as herein set forth, and for the purposes described.

81,038.—BRAIDING MACHINE.—Wm. Tunstill, Paterson, N. J.

I claim the ring, 17, applied in the manner specified, to receive motion from the weight in case a thread breaks in combination with the stop motion lever, 23, and coupling or clutch, substantially as set forth.

81,039.—COOKING STOVE.—Nicholas S. Vedder, Troy, N. Y.

I claim, 1st, The flue chamber, B, when formed by the top plate, A, of the stove, and the part, C, substantially as herein shown and for the purposes set forth.

2d, The stovepipe hole, H when formed on the part, C, in the rear of the opening covered by plate, D, in combination with flue chamber, B, substantially as herein described and shown.

3d, The part, C, when constructed and arranged in combination with the top plate, A, of a cooking stove, either for a reservoir, E, or boiler plate, D, substantially as and for the purposes set forth.

81,040.—TAPE BOX.—Marcus B. Westhead, Manchester, Great Britain.

I claim as a new article of manufacture a tape holder consisting of the slitted box, a, containing a series of loose disks, e, to separate the rolls of tape, substantially as described.

81,041.—HARNESS TREE.—J. H. Whissemore, Mansfield, Ohio.

I claim the harness tree, A, and plate, b', when the same are provided with lips or flanges, and so combined and arranged as to form the opening, c, and a continuous groove, a b, for the pad and tug strap, said groove extending in both directions beyond the plate of the tree, as described and for the purpose specified.

81,042.—RICE POUNDING MACHINE.—J. H. White, Lima, Peru.

I claim the mortars, a, with bottoms, b, in combination with the spring pestles, c c, operating in the manner and for the purpose substantially as shown and described.

81,043.—COMBUSTION CHAMBER IN COAL STOVES.—Wm. H Whitehead, Chicago, Ill.

I claim, 1st, The air chamber composed of the plates or disks, A and B, provided with flanges or supports, b and c, and the interior projections, e and f, arranged so as to admit a continuous thin sheet of air, substantially as specified.

2d, The application of the fire brick or protector, D, to the under surface of the air chamber, substantially as and for the purposes specified.

3d, The combination and arrangement of the plates A B and C, with the fire brick or protector D' substantially as and for the purposes specified.

81,044.—HARVESTER CUTTER.—Wm. N. Whiteley, Springfield, Ohio.

I claim, 1st, The cutter bar E, bent forward at its inner end, substantially as and for the purpose set forth.

2d, A spring located between the branches of the pitman and with one of its ends extending through one of said branches so as to engage with the ratchet of the nut G, substantially as set forth.

3d, A spring located between the branches of the pitman and shaped and secured so as to press the said branches asunder, and at the same time penetrate through the proper hole in one of said branches and engage with the ratchet of the nut G, substantially as set forth.

81,045.—HARVESTER RAKE.—Wm. N. Whiteley, Springfield, Ohio.

I claim, 1st, Conducting the rake stand to the coupling arm by the pivot bolts J' J', on a line parallel with and above the crank shaft.

2d, The adjusting brace K', or its equivalent, connecting the rake stand to the main shoe, substantially as set forth, so that the position of the rake stand may be adjusted in reference to the plane of the cutting apparatus.

3d, The supplemental gear wheels k' l' m', driven by the pinion h', on the main pinion shaft, and arranged at the outer front corner of the platform, in connection with the chain p', and chain wheels M' n', to communicate motion to the reel and rake shaft.

4th, The combination box t, cast in one piece, to support the pivot pins of the supplemental gears k' l' m', as and for the purpose set forth.

5th, The stop g', interposed between the heads of the joint bolts o' o', to retain them in place, substantially as set forth.

6th, The tripper c, constructed with a shank extending through the head so as to be readily secured with a screw nut, for the purpose of easy removal, as set forth.

7th, An adjustable guide frame l', substantially as described and for the purpose set forth.

81,046.—HARVESTER.—Wm. N. Whiteley, Springfield, Ohio.

I claim, 1st, The pipe box U, combined with the bars of the main frame A, in the manner shown, so that said box forms the brace connecting the rear bars A A, of the frame and the bearings for the crank shaft.

2d, The draw rod W, combined with the solid pipe box U, in the manner shown, and connecting said box to the front bar of the main frame, as and for the purpose set forth.

3d, The bridge piece f, connected to the inner shoe and to the hand lever k, in the manner shown, for the purpose of enabling the attendant to raise the cutting apparatus, as described.

4th, The hook m, in combination with the bridge piece f, as and for the purpose set forth.

81,047.—ROCK DRILL.—Caleb Whitmore, North Vernon, Ind.

I claim, 1st, The grooved cylinder S, made substantially as described, with the points of the upper inclined guides between the points of those below, in combination with the stationary guide pin T, for the purpose of turning the drill automatically as it is traversed.

2d, And in combination with the cylinder and guide pin thus constructed for turning the drill, the ratchet K and pawl U, for the purpose specified.

3d, And in combination with the devices for turning the drill, the ratchet a, and pawl b, and their connections, for traversing the carriage and feeding of the drill.

81,048.—TINSMITHS' STAKE.—A. W. Whitney, Woodstock, Vt.

I claim, 1st, The socket or head C, having two or more socket arms E, formed upon its sides, in combination with the upright or standard B, whether said socket or head C, is formed solidly upon or is detachably and adjustably secured to said upright or standard B, substantially as herein shown and described and for the purpose set forth.

2d, Forming the stakes F without shanks, and with tenons upon their inner ends, to adapt them to the socket arms, E, of the socket or head C, substantially as herein shown and described.

81,049.—SCREW CUTTING MACHINE.—S. Lloyd Wiegand, Philadelphia, Pa. Antedated July 29, 1868.

I claim, 1st, The gear, constantly engaged in the leading screw, and the cam and the detent or pawl, combined and used therewith, substantially as shown and described, for preventing the re-engagement of the nut or segment of a nut in improper positions in the leading screw.

2d, The gear, constantly engaged in the leading screw in combination with the cam and detent, as described and shown, to prevent the re-engagement of the cutting tool in the work when in improper positions.

81,050.—WASHING MACHINE.—A. G. Wilkins, Cooperstown, Pa.

I claim, 1st, A rocking tub, A, which is provided with transverse rows of beaters or pounders, G arranged as described, in combination with the stationary resisting arms, F, arranged in two parallel rows, and adapted to operate substantially as described.

2d, Arranging the beaters, G G, so that their edges, e e, overhang the bottom of the tub at the point where the squeezing of the clothes is performed, in combination with the pendants, F F, e c, and the stars, H H, substantially in the manner and for the purpose described.

81,051.—OIL CUP.—N. Bangs Williams, Providence, R. I.

I claim, 1st, the spring bolt, D, in the screw cover of an oil cup, made and operating substantially as described.

2d, The combination of the bolt, D, and the screw, E, with the cover of an oil cup.

3d, The regulating screw, F, made with the tapering slot, c, the spring point, d, and the broad, disk-like head, all made as described.

4th, The packing of an oil cup with fibrous disks, when these are not encased in a tube or chamber, and where they are threaded upon a slotted screw, which at the same time forms the compressing agent for the fibrous disks, and a graduating duct, for admitting the oil into the duct on the stem of the cup, by screwing into the same, all made and operating substantially as set forth and described, or their mechanical equivalents.

81,052.—STEAM PISTON PACKING.—W. Wilson Galesburg, Ill.

I claim the arrangement of the rings, C C, with the pieces, D D, skeleton R, and the follower, A, as herein set forth.

81,053.—COAL STOVE.—George O. Woodcock, Claremont, N. H.

I claim, 1st, The flue, D, when constructed and made detachable, and arranged within the chamber, J, and combined with the back plate, E, substantially as and for the purposes specified and set forth.

2d, The back, E, when made convex frontwards, and as for the purposes specified.

3d, The combination and arrangement of the air chamber, J, the spaces, I, and the convex back, E, and the flue, D, substantially as described and set forth.

81,054.—CULTIVATOR AND PLOWER COMBINED.—Lewis R. Wright, Troy, N. Y.

I claim, 1st, The double mold board, B and C, so hinged and connected together that the main part of said mold board, B, may be elevated or depressed at will, according to the hight of furrow desired to cut, substantially as fully hereinbefore described and set forth.

2d, The hinging of the sections of the mold board, C and C', to the centre standard, E', whereby a lateral motion may be given to the mold boards, B and B', to regulate the width of furrow to be cut, substantially in the manner and for the purposes more fully hereinbefore described and set forth.

3d, The slotted arms, or their equivalents, D D, in combination with the mould boards, B and B', substantially in the manner and for the purposes described and set forth.

4th, The upright or tooth shoe, E, in combination with the brace, F, or its equivalent, all cast in one solid piece, substantially in the manner and for the purposes herein described and set forth.

5th, The curved reversible tooth, H, in combination with the tooth shoe, E, and brace, F, each being constructed and operated substantially in the manner and for the purposes hereinbefore described and set forth.

81,055.—PHOTOGRAPHIC CAMERA.—J. H. Wyckoff and W. K. Wyckoff, Ripon, Wis.

We claim, 1st, The adjustable pivoted pendant, D, with its sliding bar or rod, E, and the frame, F, for holding the dark slide or plate holder; and, further, the special and particular method with a pivoted pendant made adjustable upward and downward, and with a to-and-fro or a lateral transverse oscillating movement on the arc of a circle, carrying a chemically-prepared plate across the opening behind the lens tube or tubes in making sun pictures, substantially as set forth and described.

2d, The combination and arrangement of these various parts, making the apparatus or device complete.

81,056.—CHURN.—Charles E. Zimmerman, Cincinnati, Ohio.

I claim the arrangement, substantially as described, of the cream chamber, A, bearings, B B' C C', removable frame H, with its shaft, I k, and dashers, J, crank shaft, L l l' M, apertures, N n, and swinging brackets, R R', or devices substantially equivalent, for the purpose set forth.

81,057.—MANUFACTURE OF WATER PROOF PERCUSSION CAPS, &c.—Bethel Burton, Brooklyn, N. Y.

I claim the use of shellac or other gum resin mixed with alcohol or other readily-evaporable liquid solvent, in compounding fulminating matter, which serves the purpose of rendering it impervious to damp or wet, and indestructible by coming in contact with oil or grease, and which will preserve it from the action of the atmosphere in all climates, and for use in all purposes where ignition by friction, percussion, or concussion is required, as specified.

81,058.—PRIMING METALLIC CARTRIDGES.—Bethel Burton, Brooklyn, N. Y.

I claim, 1st, The firing pin, h, when made with a piston on its rear end, working in the cylindrical cap, f, which cap also works in the cylindrical cup, a, all as shown and described, and for the purpose specified.

2d, The application and arrangement of the prepared fulminate on paper, cloth, or other suitable materials, which may be separately cut with safety, and combined for use in cartridges, substantially as set forth.

3d, The mode of separating the two prepared disks or wafers by means of an annular washer, substantially as set forth.

81,059.—BREECH LOADING FIRE ARM.—Bethel Burton, Brooklyn, N. Y.

I claim, 1st, The construction of the breech or cylinder, with the opening for the slide, e, to pass under the ring, c, by which means the opening is entirely closed from access of sand or dirt, when the breech is closed.

2d, The recoil block, u, steady pin, i, and slide, c, combined with the breech

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pin, f, and sectional screws or cam, which enters the recess at o, for combining or coupling the same without the use of a screw or other fastening.

3d, The manner of combining the extractor, q, with the slide, e, by means of the slot or recess, v, dispensing with screws or other fastenings.

4th, The combination and arrangement of the spring hammer, l, with the sliding breech, so that by one and the same motion the said breech is opened to receive a cartridge and the empty cartridge shell ejected from the chamber by the pressure of the hammer, substantially as set forth.

5th, The hook-ended finger, h upon the trigger, k, the slot and lip in breech pin, f, the safety bolt, fig. 31, for keeping the breech pin locked, and as set forth.

REISSUES.

48,503.—BUCKLE.—Dated July 4, 1865; reissue 3,072.—Truman G. Bailey, Amenia, N Y.

I claim, 1st, The wedge, C, and also the wedge, D, with the tongne, G, attached, and forming a part thereof, each of said wedges separately, and also in combination with each other, when made in the form described and applied to a buckle frame, for the purpose of relieving, by compression, the strain upon the trace, substantially as above described.

2d, The wedges, C and D, with their inclined faces, C1 and D1 and tongne or spur G, arranged to the enclosing strap, B1, the buckle frame, B, the strap, E, and spring, F, or each of their equivalents, substantially in the manner and for the purpose herein set forth.

71,955.—SUSPENSION BRIDGE.—Dated December 10, 1867; reissue 3,073.—Charles Bender, New York city.

I claim, 1st, The construction and arrangement of one or more yielding joints connecting the beams or trusses of stiffened suspension bridges, substantially as and for the purposes described.

2d, The plates, N, fitted together as shown in fig. 2, and combined with the fulcrum bolts, E of the yielding joints of the trusses, substantially as and for the purposes set forth.

3d, The attachment of the ends of the cables or chains at or near the first or shore piers to the longitudinal beams or to the trusses of stiffened suspension bridges, substantially as and for the purpose described.

4th, The method employed to reduce the sine motion of a stiffened suspension bridge, by causing the longitudinal beams or trusses to bear against the several piers by means of projections, L, as shown in fig. 5, all constructed and arranged as herein described.

5th, The arrangement of a connection, which is rigid in a horizontal direction, between each truss and one pier, while the connections of said truss with the remaining piers are free to accommodate themselves to the expansion and contraction of the beams or trusses, substantially as and for the purposes set forth.

6th, The method of connecting the ends of the beams or trusses of stiffened suspension bridges, provided with yielding joints, to their respective piers, consisting of links, v, all arranged as and for the purposes set forth.

54,111.—CHILDREN'S CARRIAGE.—Dated April 24, 1866; reissue 3,074.—Andrew Christian, New York city.

I claim supporting the front end of a child's carriage upon two wheels, arranged between the sills of the carriage, substantially as herein shown and described.

63,378.—BROAD CAST SOWER.—Dated April 2, 1867; reissue 3,075.—F. G. Floyd and E. A. Floyd, Macomb, Ill.

We claim, 1st, The frame, A, constructed as described, shaft, B, disk, C, when arranged in relation to each other as and for the purpose set forth.

2d, The disk C, with projection, c, in combination with the shaft, B, the former being attached to the latter in the manner described.

3d, The shaft, B, with gear wheel, b, shaft, D, with gear wheel, d, and standard, E, the whole being combined and operated as set forth.

4th, The slide, F, constructed as described, in combination with pin, f, and holes f', as and for the purpose set forth.

5th, The revolving disk, C, provided with the radial flanges, c', having their outer ends projecting beyond the periphery of the disk, and curved in the manner shown, substantially as set forth.

6th, The combination of the frame, A, hopper, G, slide, F, and revolving disk, C, constructed as above set forth, all arranged for joint operation, as herein described.

7th, The frame, A, shaft, B, with wheel, b, shaft, D, with wheel, D, disk, C, slide, F, hopper, G, and bag, H, the whole being combined and operated in the manner set forth.

76,627.—SUB-SOIL PLOW.—Dated April 14, 1868; reissue 3,076—Charles R. Hartman, Vincennes, Ind.

I claim, 1st, A coulter, constructed as described, and provided with the standard C, and the rear projection d, as a new article of manufacture, substantially as and for the purpose described.

2d, The combination with the coulter and its standard, G, of the adjustable guide box, a, substantially as and for the purpose described.

3d, The combination, with the hooks C, and beam A, of a chain or other suitable bracing support, having an adjustable connection either with the hooks or beam, substantially as and for the purpose described.

33,096.—PLOW.—Dated August 20, 1861; reissue 3,077.—Nixon and Company, Alliance, Ohio, assignees of Charles O'Bryan and Henry Kreps.

We claim, 1st, The combination of the beam, A, provided with the yoke, B, and bandles, C C, with shares, D, attached, and the braces, E E, arranged as and for the purpose set forth.

2d, Making the handles, C, and standards in one piece, and so pivoting or connecting the same to the yoke or bow, B, of the beam as to be rendered adjustable, substantially as and for the purpose set forth.

3d, The combination of the beam, A and bow B, of one entire piece, and so arranged that one of the arms of said bow is longer than the other, and so attached to the bandles or standards as to admit one of the shovels to be in advance of the other, substantially as and for the purpose described.

73,122 — GLASS LAMP.—Dated January 7, 1868; reissue 3,078. Division No. 1.—Ripley and Company, Pittsburg, Pa., assignees of Daniel C. Ripley, same place.

We claim a glass lamp with two or more pressed handles, which are so formed and attached that they perform the double function of bandles and braces between the base and the bulb or body of the lamp, substantially as described.

17,520.—CARRIAGE WHEEL.—Dated June 9, 1857; reissue 3,079.—James D. Sarven, Columbia, Tenn.

I claim 1st, A carriage wheel, constructed with a wooden hub, in which the spokes are arranged at the said hub so as to have a bearing surface or support between each other, so as to form a continuous body or band around the said hub, substantially in the manner and for the purpose set forth.

2d, A carriage wheel, in which the hub is constructed by combining a wood centre and a metallic band or bands, flange or flanges, arranged so that the said metallic band or flange forms an additional bearing or support for the spokes, when the bands or flanges upon the opposite sides of the spoke are connected together through or between the spokes, to unite the two flanges, and form, as it were, one metallic band, through which the spokes pass.

50,181.—FRUIT JAR.—Dated September 26, 1865; reissue 3,080.—John Jay Squire, New London, Conn.

I claim, 1st, Closing the vent hole, D, and supply hole, E, of the cover of a jar, by means of a cap, F, substantially as described.

2d, Holding the covers of jars or vessels in place by means of elastic bands or straps, or other equivalents, applied substantially as shown and described.

13,188.—SPRING BED BOTTOM.—Dated July 3, 1855; improvement 165, dated June 9, 1857; reissue 683, dated April 5, 1859; reissue 112, dated August 6, 1861; reissue 3,081.—Tucker Manufacturing Company, Boston, assignees, by mesne assignments, of Hiram Tucker, Newton, Mass.

I claim, 1st, The combination of a series of wooden slats or bars with a frame or box, by means of two stirrup or lifter springs for each slat, by which the latter is supported at or near the ends thereof, substantially as set forth.

2d, The combination of each of a series of wooden slats or bars with a frame or box, by means of coiled stirrup or lifter springs supporting the slats and being coiled by weight imposed upon the slats, and uncoiling themselves as weight is removed from the slats, the combination being substantially such as described.

3d, The combination of a series of wooden slats with a frame or box, by means of two springs supporting each end of each slat, and acting by coiling and uncoiling, whereby each slat is not only supported, but also prevented from rolling, substantially as specified.

4th, The combination of cylindrical rods or bars enclosed in the coils, with coiled springs supporting wooden slats in a bed bottom, substantially in the manner set forth.

5th, The combination of each of a series of wooden slats with a bed bottom by means of stirrup or lifter springs and a band loop, whereby each slat is supported at or near the end thereof, substantially in the manner specified.

6th, The combination of a series of wooden slats, with a frame by means of lifting springs and tension springs, substantially as described.

7th, A series of wooden slats, arranged longitudinally in a frame, in combination with the head and foot rails thereof, by means of springs, substantially in the manner and to produce the results specified.

8th, A series of wooden slats, arranged longitudinally in a frame, in combination with the head and foot rails thereof, by means of springs, and in combination with each other, by means of a flexible band, this combination being substantially such as specified.

21,575.—LAMP.—Dated September 21, 1858; reissue 3,082.—Rufus Spaulding Merrill and William Carleton, Boston, Mass., assignees of Christian Reichmann, Philadelphia, Pa.

We claim, 1st, The combination of a flat wick tube with a dome or deflector, having a corresponding oblong opening or slot, under the arrangement substantially as shown and described, so that, while directly connected with each other, the said parts shall allow light to pass out, or be reflected from between them, as set forth.

2d The combination of a flat wick tube with a slotted dome or deflector and arms or frame, whereby the said dome is held on the wick tube in an elevated position in relation thereto, substantially as and for the purposes shown and described.

3d, The combination of the deflector, and its supporting arms or frame and sleeve with the wick tube, substantially as and for the purposes set forth.

4th, A lamp burner, composed of two groups of elements, the first consisting of the base, with its wick tube and wick-adjusting rack and pinions, the second, of a chimney holder, deflector, and such other parts as may be needed for the proper combustion of the fluid so as to produce an illuminating flame, the two groups being united by friction, and the latter, when in position in the burner, being supported by the former, without the intervention of any mechanical device, whereby the two may be rigidly connected together, substantially as and for the purposes herein shown and set forth.

5th, The combination, with a flat wick tube, of a correspondingly slotted but elevated dome, provided with peripheral springs, for holding the chimney in proper position, as set forth.

6th, The combination, with the base and flat wick tube, of a chimney rest or holder, an elevated dome provided with peripheral springs, and a sleeve and frame or arms for holding said dome in position with respect to the wick tube, substantially as and for the purposes herein shown and described.

7th, The combination, with the dome or deflector, of a series of arms projecting from the periphery of said deflector, and arranged as herein described, so as to constitute both the seat or rest for the lamp chimney and the the springs by which the said chimney is steadied and held in position, substantially as set forth.

DESIGNS.

3,154.—FEET AND STEMS OF GLASSWARE.—Thomas Cutter, Birmingham, assignor to Frank Semple, H. C. Fry, and John D. Reynolds, Pittsburg, Pa.

3,155.—COOKING STOVE.—Harrison Eaton, Amherst, N. H.

3,156.—TRADE MARK.—B. L. Fahnestock, Pittsburg, Pa.

3,157.—ADVERTISING PANEL.—George Fay, Newton Mass., assignor to himself, J. Henry Simonds, and Henry Chase.

3,158.—SEWING MACHINE FRAME.—Henry J. Hancock, New York city.

3,159.—PERAMBULATOR BODY.—Charles Lyne, Philadelphia, Pa.

EXTENSIONS.

FIRE ARMS.—Horace Smith and D. B. Wesson, of Springfield, Mass.—Letters Patent. No. 10,535, dated February 14, 1854; reissue No. 279, dated October 10, 1854.

We claim the combining the percussion hammer, the piston slide and the barrel, so that the said piston slide shall not only serve as a breech to the barrel, but at the same time as a means of conveying (by concussion) to the priming of the cartridge at one end of the slide the force of the blow of the hammer upon the opposite end of the slide, as specified.

We also claim the improvement in the carrier, whereby it is not only enabled to be moved downwards while the breech slide is forward against the barrel or cartridge therein, but is caused to expel from the chamber, E, in which it moves, the remainder of the cartridge, after such remainder has been retracted by the piston slide, and while the carrier is being elevated with another cartridge, the said improvement consisting in making the carrier with an opening or passage leading out of the cartridge chamber thereof, and of a width sufficient for the movement of the piston slide out of the carrier during the descent of the latter, and providing said carrier with one or more projections, a2, or the equivalent thereof, which, when the carrier is elevated, shall move against the remainder of the cartridge, and elevate and expel it from the fire arm, as stated, the breech slide or piston slide being formed substantially as specified.

We also claim the arrangement and application of the percussion hammer, with respect to the breech slide, H, and the trigger guard lever, so that the hammer may be moved and set to full cock by the action of the slide, induced by the action of the trigger guard lever, as specified.

We also claim the improvement of making the front end of the piston slide with a dove tail recess, a', or its equivalent, for the purpose of enabling the slide to seize the metal or remainder of the cartridge and withdraw it from the barrel when it (the piston slide), is next retracted, the said remainder being discharged from the side by the upward movement of the carrier, all substantially as specified.

CARTRIDGES.—Horace Smith and D. B. Wesson, of Springfield, Mass.—Letters Patent, No. 11,496, dated August 8 1854.

We claim the arranging of the tallow within the cartridge, and between the ball and charge of powder, or in a chamber, c, suitably made in the rear of the ball of the cartridge, whereby the necessary amount of tallow for a discharge is preserved, with the charge, in a convenient and compact form.

We also claim the employment, in the cartridge, of the metallic or indurated disk or seat plate, so that it shall rest directly on the powder, in combination with arranging the priming or percussion powder in rear of said disk, or on that side of it opposite to that which rests against the powder, our said arrangement of the disk and priming affording an excellent opportunity for applying the force of the blow by which the priming is inflamed, such force being applied in the line of the axis of the cartridge.

WOODEN PAVEMENT.—George T. Bigelow, of Boston, Mass., administrator of Samuel Nicolson, deceased.—Letters Patent, No. 11,491, dated August 8, 1854; reissue No. 1,583, dated December 1, 1863; reissue No. 2,748, dated August 20, 1867.

I claim 1st, Placing a continuous foundation or support as above described directly upon the roadway, then arranging thereon a series of blocks, having parallel sides, endwise in rows, so as to leave a continuous narrow groove or channel way between each row, and then filling said grooves or channel ways with broken stone, gravel, and tar, or other like materials.

2d, I claim the formation of a pavement by laying a foundation directly upon the roadway, substantially as described, and then employing two sets of blocks, one a principal set of blocks, that shall form the wooden surface of the pavement when completed, and an auxillary set of blocks or strips of board, which shall form no part of the surface of the pavement, but determine the width of the groove between the principal blocks, and also the the filling of said groove when so formed between the principal blocks, with broken stones, gravel, and tar, or other like material.

3d Placing a continuous foundation or support, as above described, directly upon the roadway, and then arranging thereon a series of blocks having parallel sides endwise, in a checkered manner, so as to leave a series of checkered spaces or cavities between said blocks, and then filling said checkered cavities with broken stone, gravel, and tar, or other like material.

4th, I claim the formation of a pavement by laying a foundation directly upon the roadway, substantially as above described, and then employing two sets of blocks, viz., one a principal set of blocks, that shall form the wooden surface of the pavement, and an auxillary set of blocks, that shall form no part of the wooden surface of the pavement, but determine the dimensions of the tesselated cavities between the principal blocks, and then filling said tesselated cavities with broken stone, gravel, and tar, or other like material.

SEWING MACHINES.—George A. Leighton, of Lawrence, Mass.—Letters Patent, No. 11,284, dated July 11, 1854.

I claim, in combination with the longitudinal movements of the two needles of the sewing machine laternal movements of one needle, so that the forward and backward movements of each needle shall be respectively on opposite sides of the other (instead of on the same side of it), whereby the crossings of the loops are made to be drawn into or directly over the holes made through the cloth or material sewed, and so as to produce a very flat seam, substantially as specified.

PROCESS OF MAKING STEEL DIRECT FROM THE ORE.—George Hand Smith, of Rochester, N. Y.—Letters Patent, No. 11,338, dated July 18, 1854; reissue No. 2,334, dated August 14, 1866.

I claim the combination of the process of deoxidizing iron ore and carbonizing the metallic particles, substantially such as herein described, with the process of melting in crucibles, substantially as and for the purpose described.

HORSE POWER.—James Brayley and Mary Pitts, of Buffalo, N. Y., administrators of John A. Pitts, deceased.—Letters Patent, No. 11,232, dated July 4, 1854; reissue No. 80, dated May 14, 1861.

We claim, 1st, So combining an internal gear main driving wheel with two pinions working at diametrically opposite sides thereof, as that said main wheel may move in a direction transverse to that of a line drawn through said pinions, for the purpose of allowing said main wheel to automatically adjust itself to said pinions, substantially as and for the purpose set forth.

2d, Hanging the pinions of a double geared horse power in adjustable bearings, so that they may be set in close mesh with the main or master wheel, substantially as described.

3d, In so combining the pinions and bevel wheels upon one shaft, in pairs, and supporting them in adjustable bearings as that their shafts may be kept in a perpendicular position while the two gears are made adjustable to the respective wheels that they mesh with, substantially as described.

HAY PRESS.—Levi Dederick, of Albany, N. Y.,—Letters Patent, No. 11,043, dated June 6, 1854.

I claim traversing the follower parallel by two sets of levers or toggle joints, with one lever of each set extended beyond the joint of connection, so as to form a lever to operate the joidnts, when they are so arranged that the lower set or joint may work or vibrate between the fulcrum levers of the upper one, the two levers, C and D, being connected together by a rod or links, the whole being constructed and operated substantially as described, for the purpose set forth.

MACHINE FOR EXCAVATING EARTH.—John Taggart, of Boston Mass.—Letters Patent, No. 11,242, dated July 4, 1854.

I claim the combination of the graviating weight, u, and its line, t, with the windlass barrel, S, and the brake wheel, u', so as to operate automatically, and rotate both windlass and brake wheel, and not only take up the slack of the rope, o, while the scoops are being elevated, as described, but the same time to set the brake wheel ready for action of the brake when it becomes necessary to drop the scoops in order to discharge their load.

I also claim the arrangement of the branch lines f g, of the line, N', so as not only to operate through the ends of the scoop levers, but also through guiding or sheave passages of the boom, such an arrangement of the branch lines producing an increase of draft on the scoop levers during the operation of closing them, as specified.

I also claim, in combination with the afore-described arrangement of the line, N', through the sheave openings of the boom, K, and the two scoop levers, or about their sheaves, as specified, the union of the branches into one line, in connection with the carrying such line through a compensating passage of the boom, K, and permitting it to slide freely through the same, in manner as described, the same being for the purpose of enabling the scoops to close together or upon an object, whenever the movement of one of them, during the operation of closing them together, is arrested by contact with an obstacle, as explained.

I also claim the combining the boom, K, and the working ropes of it and its scoops, with a crane, substantially as specified, so that the scoops may be free to be moved, not only vertically, but also in any direction, either towards or away from, or laterally, with respect to the crane and its platform, whereby, while the scoops are grasping a stump or other article adhering to the mud or earth, a lateral movement of the crane may be employed to effect leverage on the scoops in a lateral direction, so as to aid in disengaging the stump or article grasped by the scoops, and to effect this without injurious strain on the boom, or the parts through which the boom slides.

MACHINE FOR MAKING THE HEADS OF SHOVEL HANDLES.—Lavinia L. Bartlett, Bangor, Me., administratrix of Russell D. Bartlett, deceased.—Letters patent, No. 11,288, dated July 11, 1854.

I claim to so construct the dished wheel, F, and its cutters, i, and apply them together, substantially as described, in combination with so constructing the bearing rest, G, with a shelf, l, and bearer plate, m, or equivalent contrivances, and applying it to the wheel, so as to cause it to extend within the wheel, and enable a person to introduce the shovel bead into it, and between it and the inner surface of the wheel, and support said shovel head and turn it against the cutters, so as to cut it curved in two directions as specified.

STRAW CUTTER.—Warren Gale, Peekskill, N. Y.—Letters patent, No. 11,667, dated September 12, 1854; reissue No. 938, dated April 3, 1860; reissue No. 1,800, dated October 25, 1864; reissue No. 2,393, dated November 13, 1866.

I claim, 1st, The automatic mouth of a feed box, constructed by any means substantially the same as described, when used in combination with a revolving cutting cylinder, armed with one knife or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, substantially as and for the purposes set forth.

2d, I claim the adjustable mouth-piece, M, or its equivalent, constructed and operating substantially as and for the purposes set forth.

3d, I claim combining a revolving cutting cylinder, armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, with a hinged bottom mouth-piece of a feed-box, substantially as and for the purpose described.

4th, I claim an automatically operating mouth to a feed-box, in combination with a revolving knife cylinder, armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, when this cylinder is geared to a revolving pressure-cylinder, substantially as and for the purposes set forth.

5th, I claim making those parts of the pressure cylinder against which the knife or knives are made to cut, by having their edges brought into actual contact therewith, in sections or strips, separate from the body of the cylinder, substantially as and for the purposes set forth.

6th, I claim a revolving cutting cylinder, having one or more knives, in combination with the pressure-cylinder, having one or more radial flanges, arms, or projections, so arranged that the knife or knives shall, as they revolve, meet the flange, arm, or projection, or either of them, in actual contact, so that the material to be cut is caught between the two, drawn forward, and cut off by the pressure between the knife on one cylinder, and the flange on the other, substantially as and for the purposes set forth.

7th, I claim the flanged pressure cylinder, arranged and operated substantially as described, when the face of the flange is covered with suitable soft material to protect the edge of the knife, when used in combination with a revolving cutting cylinder, substantially as and for the purposes set forth.

8th, I claim an automatically operating mouth of a feed box, or an adjustable mouth of a feed box, substantially as described, in combination with a revolving cutting cylinder armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, and with a revolving pressure cylinder armed with one or more radial arms, flanges, or projections, substantially as and for the purposes set forth.

9th, I claim a pressure cylinder provided with one or more radial flanges, arms, or projections, and a revolving cutting cylinder, armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, when these cylinders are used in combination with a hinged bottom mouth piece of a feed box, substantially as and for the purpose set forth.

APPARATUS FOR CORKING BOTTLES.—Rebecca R. Gillett, Chicago, Ill., administratrix of Thomas W. Gillett, deceased.—Letters patent, No. 11,281; dated July 11, 1854.

I claim combining the safety cylinder or screen with the cross-bar of the charging socket, or other proper part of the bottling machine, so that the said screen will surround the bottle at the same time that the charging socket is brought over the neck of the bottle, and keep it there until the filling and corking has been completed, substantially in the manner and for the purpose set forth.

MODE OF CONSTRUCTING METALLIC ROOFING.—Henry Outcalt, Wilmington, Ohio.—Letters patent, No. 11,292, dated July 11, 1854.

I claim scrolling the edges of metallic plates, so as to form a tube or cylinder, and then connecting their edges by means of other scrolls, which are formed also into tubes on the edges of a narrow strip of the same kind of plate, and being somewhat larger than the former tube or scroll, so that they will slide over and fit snugly to it, for subserving three different purposes, viz., first, for protecting the roof against injury from "contraction" and "expansion;" second, for the purpose of preventing the water from driving through the roofing at the scrolls; third, for the purpose of supporting the roof and all superfluous weight that may accumulate, such as snow, etc., without any superstructure other than those on which its ends rest, the whole being arranged and constructed as described.

CULTIVATOR.—Griffith Lichtenthaler, Limestonesville, Pa.—Letters patent, No. 11,379, dated July 25, 1854.

I claim the method, herein shown and described, of attaching the shares, G, to the beams, A, viz., having metal strips, F, perforated with holes, f, secured to the under sides of the beams, A, and sockets formed of two lips, g g, made at the upper ends of the shares, and perforated with holes, h h, in which holes, h, end in the holes, f, in the plates, E, wooden pins, i j, are passed, securing the shares to the beams, as set forth.

MAKING PAPER PULP.—Alexander Hay, Philadelphia, Pa., administrator of Marie Amédée Charles Mellier, deceased.—Letters patent, No. 17,387, dated May 26, 1857; patented in France August 7, 1854; patented in England October 26, 1855.

I claim the use of a solution of caustic soda, Na O, in a compartment of a rotary vessel separate from that which contains the steam heat, substantially as described.

I also claim the within-described process for bleaching straw, consisting in boiling it in a solution of pure caustic soda, Na O, from 2° to 3° Baumé, at a temperature not less than 310° Fahrenheit, after it has been soaked and cleaned, and before submitting it to the action of a solution of chloride of lime from 1° to 1½°, substantially as described.

WEAVERS' HEDDLES.—Jacob Senneff, Philadelphia, Pa.—Letters patent, No. 11,335, dated July 18, 1854.

I claim forming the eye of the heddle by casting or otherwise securing around and between the strands or threads composing the metallic clasps, in lieu of the cumbersome knots heretofore employed, curved on their sides, and made concave and smooth on their ends, between the strands or threads, where they form the ends of the eyes, in the manner and for the purpose herein set forth.

MACHINE FOR SAWING STONE AND MARBLE.—Albert H. Tingley, Providence, R. I.—Letters patent, No. 11,347, dated July 18, 1854.

I claim the combination of the two spring pawls, their slotted connecting-rod, the movable ratchet and its tripping pin, with the fixed ratchet of the shaft of the sprocket wheel, U, the whole being operated and made to operate together, substantially in manner and for the purpose as specified.

I also claim the series of hooked pins on the water distributor, in combination with the series of notches applied to the connecting rod for operating the water distributor, the whole being for the purpose of regulating the motion of the water distributor and of causing that motion to take place over either a portion of the wholeentire surface of the stone, as occasion may require.

EYELET MACHINE.—Hymen L. Lipman, Philadelphia, Pa.—Letters patent, No. 11,380, dated July 25, 1854.

I claim the so forming of the die and counter die or follower and anvil block of an eyelet machine by concave grooves, channels, or their equivalents, as the eyelets may be riveted or clinched on both sides by a single operation, and without turning them over, substantially as described.

ARRANGEMENT FOR LATHE CHUCK.—R. H. Garrigues, Salem, Ohio, administrator of L. A. Dole, deceased.—Letters patent, No. 11,364, dated July 25, 1854.

I claim the manner herein described, of combining and arranging the scroll screw, A, holding jaws, B, screw or mandrel, C, cutter, C', adjustable nut, F, gage plate, G, sliding catches, c d, and notched and grooved barrel, E, or their equivalents, for the purpose of constituting a machine which is capable of boring the hub entirely through in a true and perfect manner, and also of being adjusted and set so as to cut a shoulder of the required depth, and to enter the hub the proper distance, and then of being adjusted, as the operation is proceeded with, so as to square up the shoulder in a perfect manner, substantially as herein described.

SEED PLANTER.—Charles A. Wakefield, Pittsfield, Mass.—Letters patent, No. 11, 395, dated July 25, 1854.

I claim so arranging and operating the plunger, C, in connection with the receiving tube or chamber, D, and its delivery slide, B, or the equivalent thereof, that the plunger, C, ejecting the corn deposited in the receiving chamber, is made to embed the corn from the surface of the earth to its required depth obliquely into the ground, while the receiving tube or chamber, D, resting, by a front stop plate, I, on or above the ground, is made to open and close clear of all surrounding dirt, and the sides of the said chamber, D, made to act as scrapers above the recess, to clear the plunger of adhering soil, and cover the seed therewith throughout the entire withdrawal of the plunger, substantially as specified, whereby the receiving tube or chamber, D, is prevented clogging with dirt at its opening sides, the width of the opening made in the earth for the reception of the seeds is diminished, and the corn covered with more certainty, as herein set forth.

I further claim the method herein described, of operating the planter by the hand, at the side, in such a manner that the same force or pressure applied to working the plunger up and down gives to the planter, automatically as it were, one and the same obliquity of stroke, in a backwardly direction upwards, throughout its several operations, both on entering and leaving the ground, by means of the obliquely set handle, E, on the rear side of the plunger, or other equivalent arrangement of the handle, producing the same action, substantially as specified, and whereby the planter may be used with greater facility and expedition, and the recess formed for the planting of the corn so made with certainty of the necessary obliquity, without involving any delay in adjusting the direction or movement of the plunger to insure the earth on the overhanging side of the said recess falling in to cover the born as herein set forth.

LOOM.—Edward W. Brown, Stillwater, R I.—Letters patent, No. 11,352, dated July 25, 1854; reissue No. 1,901, dated March 14, 1865.

I claim, 1st, The combination of the pattern chain, the pawls, and the reversible tappet shaft, or their equivalents, substantially as described.

2d, The tappet shaft, connected and operating substantially as herein described, to turn about its axis in either direction, or remain at rest, as desired, for the purpose specified.

3d, The reversible tappet shaft, or its equivalent, in combination with the pawls, or their equivalent, constructed and arranged substantially as described, and for the purpose specified.

CLEANING TOP CARDS OF CARDING MACHINES.—Horace Woodman, Biddeford, Me.—Letters patent, No. 11,448, dated August 1, 1854; reissue No. 514, dated December 8, 1857.

I claim, 1st, The application and adaptation of the grooved cam, arranged with a sliding bar, substantially as specified, or the equivalent therefor, as a means of producing the reciprocating motion by which the raising and depressing of a top card, or the reciprocating movements of the brush bar in cleansing a top card, may be effected.

2d, The combining of lifter cams, T T, and a brush bar, V, with one rotary shaft, R, so that by the movements of such shaft in the manner specified, the operations of raising and depressing a top card, and cleansing it, may be effected in the manner set forth.

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,334.—DIRECT-ACTING ENGINE AND PUMP.—C. B. Hardick and John Hardick, Brooklyn, N. Y. April 23, 1868.

1,849.—MANUFACTURE OF METAL CASTINGS.—Edward L. Brown, Philadelphia, Pa. June 5, 1868.

2,054.—LIQUID METER.—Robert Creuzbaur, Brooklyn, N. Y. June 29, 1868.

2,088.—APPARATUS FOR GENERATING AND BURNING THE VAPOR OF NAPHTHA.—Joseph W. Bartlett, New York city. June 29, 1868.

2,108.—COMPOSITIONS APPLICABLE TO PRINTING, AND TO THE MANUFACTURE OF PRINTING MATERIALS AND OF EMERY CLOTH, ARTIFICIAL HONES, AND OTHER POLISHING SURFACES.—Lewis Francis, New York city. July 2, 1868.

2,130.—AUTOMATON TOY.—Wm. F. Goodwin, New York city. July 3, 1868.

2,211.—RAILWAY CARRIAGE.—Thos. C. Hargrave, Boston, Mass. July 13, 1868.

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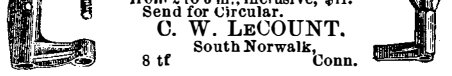

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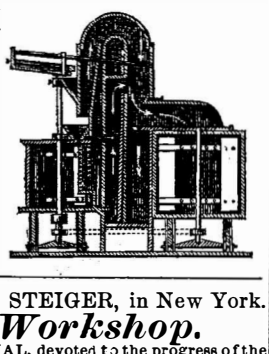

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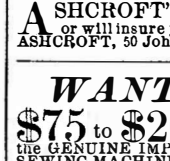

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